

RESTRUCTURING OF ENERGY INDUSTRIES

HEARINGS

BEFORE THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

ONE HUNDRED SEVENTH CONGRESS

FIRST SESSION

JUNE 13, 2001

ECONOMIC ISSUES ASSOCIATED WITH THE RESTRUCTURING OF
ENERGY INDUSTRIES

JUNE 20, 2001

THE ROLE OF THE FEDERAL ENERGY REGULATORY COMMISSION
ASSOCIATED WITH THE RESTRUCTURING OF ENERGY INDUSTRIES

JUNE 28, 2001

THE IMPACT OF ELECTRIC INDUSTRY RESTRUCTURING ON SYSTEM
RELIABILITY

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ECONOMIC ISSUES ASSOCIATED WITH THE RESTRUCTURING OF ENERGY INDUSTRIES

WEDNESDAY, JUNE 13, 2001

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Committee met, pursuant to notice, at 9:33 a.m., in room SD-342, Dirksen Senate Office Building, Hon. Joseph I. Lieberman, Chairman of the Committee, presiding.

Present: Senators Lieberman, Durbin, Cleland, Carper, Carnahan, Thompson, Stevens, Collins, and Voinovich.

OPENING STATEMENT OF CHAIRMAN LIEBERMAN

Chairman LIEBERMAN. Good morning and thank you all very much for coming.

Since this is our first hearing since the transition within the Senate, I wanted to begin by just saying what a great honor it is for me to become Chairman of the Senate Governmental Affairs Committee. This is a Committee with a proud history, and I hope and believe on a bipartisan basis we can make its future as proud.

It is an honor for many reasons for me to become the Chairman, but perhaps the most meaningful is that one of my childhood heroes and later one of my mentors, Senator Abe Ribicoff of Connecticut, served as Chairman of this Committee back in the 1970's. Under his leadership the Committee did what was right to protect the interests of the American taxpayer, and that is a legacy that I hope all of us will carry on.

I want to particularly thank my friend and colleague, Senator Fred Thompson of Tennessee, for the distinguished and thoughtful leadership he has given this Committee over the past several years. Though we are switching seats today, I know that Fred and I will continue our very strong working partnership in pursuit of the fulfillment of the responsibilities of this Committee, which, as I see them, are to make sure that the people that we represent have the most responsive, efficient, ethical, and economical government that we can provide them. Sometimes fulfilling this responsibility will lead to producing legislation, but I think uniquely within the Senate Governmental Affairs Committee more often it will involve oversight.

Over the course of the next 2 weeks, we will be paying particular attention to the economic interest of the taxpayers as consumers of electricity and natural gas. As a Committee charged with oversight, it is our job to make sure that Federal agencies are doing their job

to fairly and appropriately protect the interests of the American people.

America now faces an array of serious energy problems. Whether it is the price of gasoline in the Midwest, shortages of heating oil in the Northeast, consumers and businesses struggling to pay their natural gas bills, or electricity blackouts and price spikes in California, energy price and supply problems are becoming regular events from one end of the Nation to the other. I think that if we ignore these problems, we put our economy at risk. California accounts for 15 percent of the U.S. economy. If you add its Western neighbors Oregon and Washington, which are also part of this most recent crisis, we are talking about the health of roughly one-fifth of the American economy. And earlier this spring, the North American Electric Reliability Council issued warnings not only about California and the Pacific Northwest but New England and New York City as well. So none of us should say of the West's problems today that we will not face them in our part of the country tomorrow.

What the Federal Government does in this situation out West, I think, will set a precedent for what it will do in the next energy crisis elsewhere in America. So today and again next Wednesday, when we will hear from the members of the Federal Energy Regulatory Commission, Governor Davis of California, and another witness that Senator Thompson will call, we will be looking at the role of the Federal Government in addressing the issues of energy price and supply. In particular, we are going to be looking at the effects of deregulation on the energy market and how FERC has carried out its responsibility to oversee these changes.

FERC was created in 1977 under the Department of Energy Organization Act and charged with the same responsibility as its predecessor, the Federal Power Commission, to set just and reasonable wholesale energy rates. But I doubt that there is any among us today that would say that California's energy costs are now just and reasonable.

In 1999, the State spent \$7 billion—that is all of the consumption of electricity energy, \$7 billion on energy. Last year the number multiplied to \$27 billion, and estimates for this year go as high as \$70 billion, even though Californians are conserving and using 11 percent less energy today than last year.

In fact, last fall FERC itself said that electricity prices in California were not just and reasonable. Like most of our expert witnesses today, in fact, I think maybe all of them, I am a fan of free markets. I do not believe in price controls or price caps or other economic contrivances that inhibit the free marketplace, but the energy market in California and the West is not free today. It may not even be functional. So we need to examine, I think, the appropriate role for regulators when the market does not work.

This is a matter about which we may differ, but the differences should not be, and I do not believe are, partisan or personal. In fact, the primary legislative response to the crisis in the West that has been proposed is bipartisan, the legislation authored by Senators Feinstein and Gordon Smith, and I hope that our deliberations in this Committee will focus on finding a solution rather than on finding a scapegoat.

We are fortunate to have a distinguished panel of nationally renowned economists to help us understand the changing nature of the energy markets and how consumers have been affected by the transition from the regulation of electricity and natural gas at the State and Federal levels to an unregulated, more market-oriented system. The fact is that 25 States and the District of Columbia have moved to deregulate their electric utility systems, but the recent experience of California in both electricity and natural gas markets and the price hikes in the Midwest in 1999 and the Northeast last spring have very serious doubts about this new world of spot markets, electricity futures, and open access to natural gas and electricity transmission systems.

Several States on the verge of regulation, including two of California's Western neighbors, New Mexico and Nevada, have blinked and put the brakes on deregulation, and that is understandable considering what has been happening in California. So I think that if the Federal Government doesn't find a way to provide temporary price relief out West now, the natural and, I think, desirable trend toward deregulation across the country will come to a halt.

So I look forward to the testimony of our witnesses. I hope they will help us learn the lessons we need to learn from what is happening in California and in the Western grid and outline for us the role they think the Federal Government needs to play in these new markets. I hope they will tell us what we can do when, as in the case of California, good intentions go painfully off course.

I am now going to call on Senator Thompson. I do want to say in this first hearing that I have the privilege to Chair that I am going to borrow some of the procedures that I have learned on the Armed Services Committee, with the indulgence of my colleagues, and just have Senator Thompson and myself give opening statements but extend the time for questioning in each round by the Members of the Committee to 10 minutes, so that if they wish to make an opening statement they can do so during that 10-minute time. And we will call on Senators in order of arrival, switching parties as we go along.

Senator Thompson.

OPENING STATEMENT OF SENATOR THOMPSON

Senator THOMPSON. Thank you very much, Mr. Chairman, and you know, as the old saying goes, if it had to happen, it couldn't have happened to a nicer guy. I look forward to working with you as we have in the past. We went through some interesting and trying times a couple of years ago, and throughout all of that and up until now, we have had a good working relationship. You have been very cooperative with me in every respect, and I intend to be the same with you. So I am looking forward to it.

The energy troubles that have plagued the State of California and the West over the past year are well known to all Americans. Most are probably as aware of the problem from stories about blackouts as they are from stories about fingerpointing and placing blame.

I think it is important to know that California's problems did not begin on January 21, 2001. Efforts to place blame on the current administration, to hire consultants at \$30,000 a month to spin the

issue, or to pit one State against another are not only misplaced, but do not help arrive at a solution.

In truth, there appear to be many causes of the problems now faced in the West. The restructured energy system in California had flaws. There was evidence of mounting problems a couple of years ago, but the State was reluctant to address them. The State was slow to react when prices rose sharply last summer. It has shied away from passing rate increases along to consumers sufficiently to affect demand, and it resisted the kind of long-term contracts that could have mitigated the current crisis.

In addition, natural gas prices have risen sharply, increasing the cost of producing energy. A lack of rainfall in the Northwest has decreased the available hydro power in the region, and the best way to head off this problem, building new generations, has been difficult given the State's burdensome requirement for building new plants. In sum, California has not provided an energy supply that could meet the demand of its growing economy.

The question we face now is what should be done to address the short-term problem of power shortages and certain blackouts this summer and the long-term problem of ensuring sufficient supply to the West in the future. The long-term answer appears more clear: More supply. New generation is being built, and some estimate a sufficient amount will be online within 18 months.

In addition, signing long-term contracts could help provide stability to the region. The short-term solution is more difficult, particularly because it is so late in the game. Prices exploded last summer and stayed high all winter. Now Governor Davis has asked the Federal Government to step in and fix the problem now that it is too late for anyone to prevent rolling blackouts.

Some suggest temporary price controls through early 2003. While that may get us through the next election, temporary price controls have rarely stayed temporary, nor have they worked. President Nixon's wage and price controls, oil price controls in the 1970's, and rent control in New York City are just a few examples of temporary fixes that lasted far longer than intended and actually did more harm than good. And governments do not have very much credibility with investors when it comes to talk about temporary price controls.

Many economists, including two that we will hear from here today, believe that introducing price controls into the current situation would do more harm than good. Setting price controls could provide a disincentive to new generation and drive suppliers to other markets, creating more shortages and blackouts over the summer.

In addition, it is difficult to know how workable these solutions are. One option which will be discussed today is a cost-based price control. Under this scheme, government officials would set plant-by-plant price rates which are unrelated to the marketplace. This raises a host of practical implementation problems given that there are hundreds if not thousands of operators providing power in the Western energy market.

In addition, if you only impose price controls on investor-owned power, then half the electricity in the Western market escapes. That creates market distortions and loopholes for evasion. And

with regard to the possibility that by delaying FERC action we are in some way delaying reform in other States, my concern is we may set back the case for real reform if we lead other States to believe they can take the same measures that California did and FERC will come in and bail them out.

What FERC has done is to institute a market-based price mechanism on price levels during level one, two, and three emergencies within the State. Since that order, prices have dropped below \$100 per megawatt hour for the first time since the crisis began 1 year ago.¹ FERC has taken action, and that may be working. However, the State of California has a responsibility, too. If the governor truly believes that price controls are the answer, he has the authority to set the price that the State will pay. He can also take steps to fix the broken system in his State to prevent these types of problem in the long run.

I look forward to hearing from our witnesses today as to what possible solutions there are for the problems in the West and what the Federal Government could and should do.

Thank you Mr. Chairman.

Chairman LIEBERMAN. Thank you, Senator Thompson.

When we put out a notice that we were going to convene this hearing, we had a request from three of our Senate colleagues to testify, Senators Boxer, Craig, and Feinstein, and two of them are here and I would like to call on them and ask them to begin their testimony. And I believe Senator Feinstein may be on the way. Why don't you come to the table?

Let me also note the presence here in the room of Congresswomen Jane Harman and Anna Eshoo. These members of the House serve on the House Energy and Commerce Committee and have been very involved in fashioning a response to the crisis in their State. Obviously, this is a topic of enormous importance to the people of California, and the presence of these two distinguished colleagues from the House testifies to their very deep and active interest, and I thank them for being here.

Senator Boxer.

TESTIMONY OF HON. BARBARA BOXER, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Thank you Mr. Chairman. I want to give the largest thank you to all of you, Republicans and Democrats alike, from my constituents, 34 million of them in California. This is really the first hearing we have had on our emergency situation. We have had emergencies before. We have had earthquakes, floods, fire, and everything else, and you have always been there for us. This one took a little longer because it is not as obvious an emergency. But trust me, it is an emergency. So thank you very, very much.

Today you are going to hear from economists about the cost-based pricing. I give it another name, Senators. I call it anti-gouging pricing, and I hope you will think of it in that light. And I called for such pricing by FERC last August, and last September

¹Chart entitled "California Day-Ahead Power Prices," appears in the Appendix on page 551.

I introduced a bill with Representative Filner of San Diego. Those are the people that felt this first. We called for such pricing.

California is facing price gouging by the electric generators. The generators' profits increased on average by 508 percent.¹ I have a chart here. We go through the various large generating companies. We average them out at 508-percent increase, and at that time that they were making the 508-percent average increase, demand was going up by 5 percent. So, Senators, I have to tell you, when you see this, it makes your stomach turn.

I have to also tell you one of these companies, who was just advertising in *Roll Call* and all the other—the *New York Times*—I have a copy of the advertisement here. I want to just hold it up. It is bragging about keeping the lights on in California, reliant energy. Their profits went up, Mr. Chairman, 1,685 percent during that period.

This is the ad. It says, "Helping California keep the lights on, reliant energy." What they did not say is "and gouging California consumers at the same time." They left out that part. It is very, very disheartening and discouraging.

One of the primary causes of price gouging in my opinion—and I leave this to you to ponder—is the generators' holding back supply. So when you talk about a free market, I say to my friends, you cannot hold back supply if it is really a market that is working.

We will show you this amazing chart.² The blue shows you how much power was taken off-line for maintenance last year. And this is how much power was taken off for maintenance this last year, current year, in the yellow. It is hard to imagine that suddenly you would have this great disparity in how much power has to be pulled off-line.

I am going to be quick—because I know you have so many folks—and make a couple more points. If the average price of milk went up the way the average price of electricity went up, we would be paying \$190 a gallon for milk from \$3. I want you to think about that. It is just stunning. And I want to leave with you this point, Mr. Chairman, and your Ranking Member and all of you good Members who care a lot about people.

We are getting letters from businesses. I have a letter from John Odaman of San Marcos, California. He wrote to President Bush and sent me a copy. He said, "I am a father and a husband in a single-income family. My wife and I very carefully planned our family economics in order to give our daughter the benefit of having a full-time parent at home. We are currently spending money on electricity bills that should be going into family investments for college and retirement planning."

Mr. Odaman and other Californians have less disposable income. I have other letters.

I have another letter from a California farmer, Ann Zack. Ms. Zack wrote to me asking for help.

She writes, "Our family has owned and operated an alfalfa ranch since 1965. Our crop is irrigated in the summer with water pumped from wells by electric pumps. We have been informed by

¹ Chart entitled "The Big 5 Energy Generator's Profits," appears in the Appendix on page 552.

² Chart entitled "Closed for Maintenance?" appears in the Appendix on page 553.

Edison that our power rate will double this summer, will possibly be raised beyond that in the future. Since we have narrow profit margin—their profit margin is not 508 percent, Mr. Chairman—“this will effectively put us out of business.”

So my question to you is: How can these electric generator executives go to sleep at night? I honestly to God do not know. They are hurting real people. This is not right. We all want our businesses to operate at fair profits. God knows that is the essence of our system. But gouging is something that must be stopped.

I met with the Vice President yesterday. It was a cordial meeting, Mr. Chairman. We did not make too much headway on this issue of caps, but I hope he will rethink it, and I hope that you will help us by getting FERC to understand that their job is to protect us from unfair and unjust and unreasonable prices and to stop the gouging now.

Thank you, Mr. Chairman, for your concern about California.

Chairman LIEBERMAN. Thank you, Senator Boxer, for your concern and for your testimony this morning.

Chairman LIEBERMAN. Senator Craig, we just had the second run of bells goes off, but we have got a good 8 to 10 minutes left. Thanks for being here this morning.

**TESTIMONY OF HON. LARRY E. CRAIG, A U.S. SENATOR FROM
THE STATE OF IDAHO**

Senator CRAIG. Mr. Chairman and Members of the full Committee, thank you very much for an opportunity to come and visit.

This is the fifth hearing on the California energy crisis I have participated in since it began well over 6 months ago. I also asked for and convened a hearing of FERC in Boise of the 11 Western States to examine what is truly a broken energy system in the West. So it is not the first time that the Congress has focused on—and I am guessing it will not be the last time that we will focus on this issue.

But my message today, Mr. Chairman, is that with the energy crisis in the West, we pay closer attention to the facts and move away from a great deal of the political myths involved. There has been much too much distortion and rhetoric in this debate. In part, I guess it is understandable.

Like other serious and complicated problems we face, the Western energy crisis is laced with both emotion and I believe now some partisanship. This is clearly evident in the statements on the crisis of high prices that have been charged for the wholesale electricity in California.

In this debate, Mr. Chairman, there have been many for their own purposes engaged in what I believe is an intentional distortion and misstatement of the facts. They say that there is no lack of supply in the West. They say that there are plenty of power plants and transmission lines to meet all of the demands for electricity. And they say that small groups of companies, based primarily in Texas, have conspired to withhold electricity from the market in order to drive prices up to an unreasonable, indeed unconscionable level.

It is they who are, I think, the unconscionable crowd in this rhetoric. They are either unconscionably ignorant because they have

not looked at the reality of what is going on out there, or they are unconscionably and deliberately distorting facts.

Now, Mr. Chairman, in all of these kinds of situations, I think we have some who are always in search of a conspiracy. And as you know, Mr. Chairman, conspiracy theorists are always around at the right time, despoiling and oftentimes using public discourse in a variety of critical ways. Conspiracy theorists reject what most of the rest of us view as plain and real. Instead, they search and usually find villains and conspirators. Some of these conspiracy theorists engage in the craft full-time. I must tell you that, as I have listened to the rhetoric of the Governor from California, I am frustrated in trying to understand where he is.

Since 1990, there has been a 26-percent increase in the demand for electricity in the State of California. During that time, not one major new power plant was constructed. I repeat, not one. Even Governor Davis, who has led in what I believe is misdirected and politically inspired assaults on independent generators in his own State, has repeatedly alluded to the fact that California has been derelict in new generation. In other words, it appears that he is working full-time to be on both sides of this issue.

Governor Davis in a prime-time speech delivered last spring said that the major problem facing the State in this crisis was a lack of available generating capacity. Despite a chronic shortfall in electrical capacity to meet peak demands, Californians have until recently been able to get bailed out of their blackouts and their price spikes, and here is why. They have relied on the hydro power of the Pacific Northwest, but now, as you mentioned, and as I think Senator Thompson mentioned, the Pacific Northwest is suffering from what is probably the worst drought since 1930. Our reservoir levels are the lowest since the 1930's.

In addition, the economic growth in the Pacific Northwest, in Arizona, and in Nevada have caused power plants in these areas to dedicate more of their output to their own localities and less to California.

To be specific, peak summer demand in the West has increased at an annual rate of 8 percent in Arizona, New Mexico, and Nevada, 3.2 percent in California, 2.8 percent in the Rockies, 2.4 percent in the Pacific Northwest. Yet, from 1991 to 1998, the growth rate of new generation capacity additions in that whole region was less than 1 percent.

All of these factors have resulted in a stark exposure of the electrical supply deficiency within California. California has been subsisting off the surplus of its neighbors, and now those neighbors have no surplus, and they have to take care of their own.

Another important part of the reality in California has been the high prices of natural gas and of securing necessary emissions credits. The cost of both have soared through the roof. The reality of the charts that have just been shown in many instances are real. This has created enormous upward pressure on the price of electricity and generating capacity of old gas-fired plants. A shortage of electrical generating capacity, a regionwide drought causing reduction in imported power and high natural gas and emission credits, these are all fundamental causes of the electricity crisis. Any

of these factors could cause or would have caused the problem. All of them combined have probably crippled the market.

Now, I believe that is the big picture, Mr. Chairman, and frankly I believe that is the true picture. How do we deal with it? And that is, of course, part of what you are looking at today. And how do we deal fundamentally with our electric and gas utilities?

I know now that the spot market in California is lower than the long-term contract prices that Governor Davis negotiated. Why? Because California recently began to expose the consumer in California to the real market price and the consumer in California began to make real choices.

It is also happening across the West as our power rates go up. Is conservation the only solution to our problem? Absolutely not. But there are no blackouts in California at this moment, and one of the reasons why is that there is an 11 percent conservation that has now taken hold in the State of California. The major utilities of California have stated that during deregulation, conservation almost stopped altogether because the consumer knew the price was fixed. Those were the realities of the situation.

Chairman LIEBERMAN. Senator Craig, forgive me. We are down to about 2 minutes left on the vote.

Senator CRAIG. Then I will conclude. I must tell you that Governor Davis has moved swiftly. While I criticize him, I must also recognize the fact that 5,000 new megawatts of power are going to come online next spring in California and 5,000 within a year, and that is an effort at reducing and changing regulation and process, and the governor ought to be applauded for that.

Let me quickly refer to FERC and what I think FERC is doing now in a very responsible fashion. Out of the Boise hearing came the new order, and that new order largely says all of those in the market have to supply capacity to that market on a full-time basis. That has helped bring those prices down.

Satisfying political preserve by choosing price caps, is not a way to fix the market. Investment is rushing to California at this moment to supply a need. They are rushing there because they believe the market is becoming more free and will be allowed to operate in a more unfettered fashion.

Let me ask that you allow to be part of the record an op-ed by Robert Samuelson this morning in *The Washington Post*. I would recommend it for your reading. It is called "Short-Circuiting Supply and Demand."¹

Chairman LIEBERMAN. Without objection.

I have noticed that the Ranking Member has been reading that op-ed here at my side this morning. I thank you Senator Craig and Senator Boxer. I think the two of you in some ways have framed the discussion that will go on here in the coming weeks.

We are going to recess now. We will come back and hear Senator Feinstein and then proceed with the witnesses. Thank you.

[Recess.]

Chairman LIEBERMAN. The hearing will reconvene. I apologize to our witnesses and others here for the interruption which was necessitated by two votes on the floor of the Senate.

¹The article referred to by Senator Craig appears in the Appendix on page 554.

We are privileged now to have the third of our colleagues who asked to testify before this hearing and lead co-sponsor of the legislative proposal responding to the price crisis in California and the West, Senator Dianne Feinstein. Thank you for being here.

**TESTIMONY OF HON. DIANNE FEINSTEIN, A U.S. SENATOR
FROM THE STATE OF CALIFORNIA**

Senator FEINSTEIN. Thank you very much, Senator Lieberman, and Senator Collins, and I saw Senator Carper. He is over here. I want to thank you for this opportunity.

I have been carefully watching as a member of the Energy Committee now what has been happening with the deregulation in California, and I have watched the problems spread to seven other Western States. So California is no longer alone.

I must tell you, Mr. Chairman and Members, that I have really come to question whether deregulation of electricity and natural gas can work. You know, when we deregulated airlines, individuals had a choice of airlines. If they did not like one, they could go to another. When we deregulated telephones, individuals had a choice. If they did not like one service, there was another.

In the area of natural gas and electricity, the consumer has no choice. You get your bill. You cannot change companies if you do not like it.

What I have also seen is that it is a broken market, caused in part by California's not having adequate generation. However, having said that, I have got to make a point. Californians have been conserving. In January, the State consumed 5 percent less energy than the previous year.

In February, the savings was 7 percent. In March it was 9 percent. And in April, Californians saved 7 percent. The energy savings last month was 11 percent, and the cost of all electricity for California in 1999 was \$7 billion. The cost in 2000 was \$28 to \$30 billion, and the costs this year are predicted to be \$50 to \$65 billion.

In that milieu, you have had two big investor-owned utilities, the middlemen, buying the power on the wholesale market, selling it to the consumer, go into bankruptcy. One is in bankruptcy. Southern California Edison, if it does not work out an arrangement with the State, will be in bankruptcy. And you have the State so far this year having spent \$8 billion buying electricity to try to keep the price low. As recently as 2 weeks ago, electricity prices in California were almost 10 times higher than they were a little more than a year ago.

Now, the Federal Power Act clearly states that if FERC, the Federal Energy Regulatory Commission, finds prices to be unjust and unreasonable, FERC must regulate and set those rates. They did find the rates unjust and unreasonable last November. They have really refused to move aggressively to set those rates, and I and many other Californians have tried to sound a consistent drumbeat to move to do that.

In late April, FERC issued a limited—what is called price mitigation order, which would cap wholesale costs during stage one, two, and three emergencies. And it now appears that on Monday, FERC may extend this order to the entire Western energy market and

may ensure that the order stays in place at all times—in other words, going to 24 hours a day, 7 days a week, and requiring power generators in the entire Western region to sell electricity back into the grid. That is another step forward.

The question I have about it is manipulation. Because this is tied to the least efficient megawatt, so it is tied to the dirtiest, most polluting plant.

Now, I ask this question: Is that then an incentive to keep dirty plants in order to drive up price and produce profitability for clean plants? And we are going to have to see.

I called the head of the independent systems operator—known as the ISO—yesterday, Terry Winters, and he agreed that this could be manipulated. He agreed that we do not have enough information yet to know whether, in fact, the acute drop in prices over the past week or so is a result of the April FERC order, whether it is a result that the generators now feel that the heat is on, whether it is a result of the Senate having changed power, whether it is a result that Senator Smith's and my bill now has a markup date in June which would set Western regional caps, we do not really know yet what the case is. But we do know a couple of things, that just a few days ago one generator admitted to selling electricity into California at \$3,000 a megawatt hour, 5,000 megawatts at that price, and that another generator fessed up to \$1,900 a megawatt. So what we still have out there is a ribald, unregulated marketplace.

The natural gas issue has been an interesting one because natural gas is three times higher in California than anywhere else in the United States. FERC is looking into this. There is no transparency when it comes to natural gas. It is very hard to tell what is going on. But when you have three times the price, when the transportation cost of natural gas should be between 50 and 70 cents a decatherm and the gas is selling, instead at \$3 or \$4, \$12 to \$15, you really come to question what is going on.

Let me give you a couple of examples of what has happened. We have one sugar refinery in my backyard. It is in Crockett, California, C&H Sugar. They employ about 1,200 people. Their normal cost of natural gas to produce steam is \$450,000 a month. It has risen to \$2 million a month. They have had to lay off people. They have had to close down the plant. They have had to try to get bridge financing. I can tell you about California steel industries with the costs escalating literally millions of dollars. Now, that is not restaurants. That is not others that use electricity as well.

You should know that yesterday the Attorney General of California announced that he will convene a criminal grand jury to investigate whether power generators illegally manipulated energy prices. The investigation will begin shortly after July 1 when a new 19-member Sacramento County grand jury is seated. As Mr. Lockyer said, this does not indicate we have reached a conclusion. It is a process to get at the truth. This is the beginning of the criminal focus.

So the belief is among many of us—and I am one—that the generating community has made use of the problems in California, quite simply stated, to manipulate the market and gouge prices.

John Bryson, CEO of Southern California Edison, testified before the Energy Committee, in answering a question of mine, that when they divested of generating facilities and sold those facilities to out-of-State generators, I asked this question: What were you selling a megawatt hour power from the facility when you owned it? The answer was \$30. Then the next question was: When it was divested, what did the company that took over ownership charge? The answer was \$300 a megawatt hour.

So, in other words, power that had been selling at \$30, when the facility was sold, they had to buy that same power back at 10 times the price. One of the reasons they are close to bankruptcy today.

I am sure Senator Craig mentioned the concerns in Idaho. I am sure Senator Burns and others can mention the concerns in Montana where you have got a mine closing where people are losing their jobs, and in these seven Western States where it is anticipated that there will be rate increases from a low of 14 percent to a high of over 100 percent.

So the situation is changing dramatically and I thank you, Mr. Chairman. I wrote you a letter urging that you take a look at some of the relationships between the big generating companies and the regulatory agency that is supposed to be regulating these very companies. We see no semblance of really meaningful regulation yet, and particularly in the area of natural gas, there is very deep concern.

My bill will be marked up, I believe, on June 27. Whether we can get it to pass the Senate or not, let alone get it to pass the House, I do not know. I should tell you, when Senator Smith and I went to see Congressmen Tauzin and Barton, they were not very sympathetic. I now think that is changing in the House, and instead of the word "control," the word "mitigation" is being substituted. Whatever you call it is fine with me, as long as it works.

Thank you very much Mr. Chairman.

Chairman LIEBERMAN. Thank you, Senator Feinstein, for very thoughtful testimony. I want you to know that we are in receipt of the letter you referred to, and we are looking into the questions that you have raised.

I am going to call now on the panel of economists who I think will begin to answer some of the questions that Senator Feinstein and others have posed. We have a very distinguished panel of economists who were asked both by myself and Senator Thompson, and I appreciate the trouble that they took to come and be with us. I have read the papers they submitted. In my opinion, though they are more accustomed to grading than I am, they all deserve high grades. They are very thoughtful and very thought-provoking.

It had been my intention to call people in alphabetical order, but since this is the Senate where we follow the seniority rule, I wonder if his colleagues would mind if I call Dr. Kahn first.

Mr. KAHN. No one is more senior than I, sir.

Chairman LIEBERMAN. Well, we do have Senator Thurmond here. But among the witnesses you are definitely the most senior.

Dr. Kahn has certainly been, I guess I would say, if you will allow me the liberty, the father of the modern deregulation movement in our country, perhaps best known for his work as Chair of the Civil Aeronautics Board during the 1970's. He is currently a

professor emeritus of political economy at Cornell University, and I am delighted that he was able to be with us today.

We are going to run this clock and ask you to try to stay within 5 minutes for your opening statements, although your full statements will be entered into the record. And then it will give each of my colleagues here an opportunity to engage in discussion for a greater period of time.

Dr. Kahn, thank you for being here.

TESTIMONY OF ALFRED E. KAHN, PH.D.,¹ ROBERT JULIUS THORNE PROFESSOR OF POLITICAL ECONOMY, EMERITUS, CORNELL UNIVERSITY

Mr. KAHN. Thank you, sir. It is an honor to be here. I should begin by recognizing that the only reason I am here is that I did play an important role in deregulating the airlines, trucking, railroads, and telecommunications, and I do not offer myself as an expert on the electric power industry. In point of fact, I have tried to stay away from the electric one because it frightened me.

I agreed partly because there are around me people who know much more about the electric industry generally, and, after all, one of them is a former student of mine, so he has been very well trained, and I urge you to listen to him carefully.

Just one other introductory remark. The discussion of the California situation has become so deplorably simplistic, if not ideological, and again I am hoping that by my having decided that I wanted to subscribe to the letter that Professor Wolak started, that we can de-ideologize it, if you will, and I have all sorts of examples that I would be happy to cite, but I am not going to waste your time because you have encountered them as well.

I think perhaps I will merely quote that eminent economist William Safire, who referred to “the demagogic call for energy price caps, always politically satisfying, populist interference with the market’s self-correction that would lead to worse shortages and rationing, to inflation and wage control.”

I suppose Mr. Safire deserves a good grade for the first 2 weeks of elementary economics, but from there on he flunks.

I hope he, however, and others like him will be satisfied that all the sybarites in California with their hot tubs and the politicians and militant consumer advocates who promised them the benefits of free markets but without the risks of being exposed to the free market—I hope the opponents of putting caps on will be satisfied that those parties have been sufficiently rewarded for their opportunism.

I have in a paper I have written—and, in fact, Paul did the same—about the opportunistic nature of the move for deregulation. Nobody was in favor of deregulation of electric power in the 1950’s and 1960’s when real rates went down. No one was in favor of deregulation in the 1970’s and 1980’s when it looked clearly as though regulation was holding rates below competitive levels. It only became a bonfire movement when in the middle 1990’s, because of mistakes that had been made in the past, it looked as though prices would go all the way down.

¹The prepared statement of Mr. Kahn appears in the Appendix on page 191.

Of course, we should have realized that since the big errors were made in the past, we should have realized that this one, too, was based on an unrealistic assessment of the future. But, in any case, here we are in the situation that has been described so well by other people, and moving beyond the first 2 weeks of Economics 101, let me just mentioned the factors that have induced me to sign on to this letter, apart from the fact that I have great confidence in the other people who signed.

First, when you have extreme inelasticity of supply and demand, when prices can go up 5-fold, 10-fold, 15-fold and not induce a substantial response in demand, very largely because these prices operate in spikes by particular times of day and particular days of the year, and consumers do not have meters that tell them those prices. So demand is highly inelastic.

But, similarly, when you have a highly inelastic supply, you reach a certain point, if you look at Severin Borenstein's figures at the end, where supply just suddenly turns vertical, and you do not get any more supply as the prices double, treble, and quadruple. Markets do not work very well, to put it mildly.

And that leads me to the second point that everybody who talks about wage and price controls in the past or caps in the past have interfered with supply, and there is a letter by some very eminent economists who apparently know even less about the electric power industry than I, who say there are all sorts of plants, higher-cost plants that will come online as prices go up. I ask you to pose that question particularly to the people who know what is going on in California. It is simply not true. The supply—no matter how inefficient the plants, there is ample reason for them to be operating if the price gets above the incremental cost of operating, and yet we have a virtually totally vertical supply curve. In those circumstances, this equilibrating character of free markets just doesn't work very well.

Third, it is true that the elasticity response was prevented by the ridiculous freezing of retail prices. That was one of these cases of "we will give you all the benefits but you will not have to bear any of the risks." And the increases that have come since have been grudgingly inadequate. But since the extreme shortages, producing 10-, 20-fold increases in wholesale prices, have been the spikes and consumers do not have meters that tell them when those spikes occur, you are not going to get the demand response. And, therefore, you can say, well, you would not have blackouts if you let the price go up to whatever extent necessary, but that extent necessary is reckoned in terms of not doubling but increasing 10-, 20-, or 50-fold. Then you have to say as against the possible benefit of a 10-fold increase in prices in getting a better balance of supply and demand, you have to realize, first of all, the income distributional consequences of that and, second, the macroeconomic consequences.

I had the misfortune to be adviser to President Carter on inflation just when we had the increase in OPEC prices from \$10 a barrel to \$40 a barrel on the East Coast, and we know that that extraction of those dollars from the pockets of consumers had a major role in promoting the stagflation from which we were all suffering. Well, look at what is happening to the California economy and the widespread distress that it is causing to a lot of innocent people,

without eliciting increased supply, without bringing about re-equilibration.

Fourth, the spectacular cases in history where price controls have done more harm than good cited by all the opponents, and correctly so, particularly in the 1970's when we held the price of crude oil below marginal costs—marginal cost was the cost of imports, and so we held the domestic prices below that. Of course, that interfered with supply, and the same thing was true with the case of caps on the price of natural gas. That clearly did interrupt supply. But the notion that caps automatically interfere with the increase of supply in the electric industry is absurd. It ignores the whole history of regulation. Look at my "Economics of Regulation." There must be 50 pages on the fact that regulation of the electric industry through this entire history has not interfered with expansion of capacity. The major criticism has been that it has led to overexpansions of capacity because it guaranteed the investors a return on their capital and they made money by investing more. So it is simply historically incorrect that regulation, recognizing the full costs of additional capacity, necessarily interferes with supply.

Moreover, one can make certain of that. The problem is that we are not going to get any new plants for 2 or 3 years. Make the caps temporary. Make them automatically sunset in the 2 to 3 years. Make them not apply to new power.

There is no shortage of people interested and willing to build new power plants, and for that they do not have to have \$1,000 a megawatt or \$1,500 or \$2,000 a megawatt. That is Economics 101.1, and I wish Mr. Safire would come back and learn it.

So we must not interfere with the fundamentally required correctives. We must press ahead with time-of-day metering or something like that. We must be willing to let retail prices go up more than the grudging amount by which they have. But where the demand and supply response takes years, it is simply sadistic to insist that elementary economics tells you that price controls do not make any sense.

Thank you.

Chairman LIEBERMAN. Thanks, Dr. Kahn. You got us off to a very good beginning, a provocative beginning.

Dr. Severin Borenstein is a professor of public policy and business administration at the University of California's Haas School of Business. He has focused on electricity deregulation, market formation, and competition. In addition, he is the director of the University of California Energy Institute and a member of the Governing Board of the California Power Exchange Corporation. So he is right in the middle of the California crisis. Thanks for being here, Doctor.

**TESTIMONY OF SEVERIN BORENSTEIN, PH.D.,¹ DIRECTOR,
UNIVERSITY OF CALIFORNIA ENERGY INSTITUTE AND E.T.
GREYER PROFESSOR OF BUSINESS ADMINISTRATION AND
PUBLIC POLICY, BERKELEY'S HAAS SCHOOL OF BUSINESS,
UNIVERSITY OF CALIFORNIA**

Mr. BORENSTEIN. Thank you, Senator Lieberman. I just want to start out by talking for a few seconds about how we got here, into the crisis that California now faces, and understanding what the problems are and, more importantly, what the problems are not.

There is no question that demand has grown rapidly in the Western United States and that we are now in a situation where there is a real tight market in the entire Western grid. There is also no question that that creates a real supply-demand mismatch. That has two effects.

One is the effect that you learn in the first 2 weeks of Economics 101, which is when demand shifts out and supply does not keep up, the price goes up.

The second effect, which is just as easy to understand if you sat through the first 6 weeks of Economics 101, is that when you are a seller and you are in a market where there are few substitutes for your product on the demand side and the other sellers are unable to expand their supply because they are already at capacity, you can raise your price without losing much in sales. Economists do not call this market manipulation. They call this exercising market power. This is not illegal under U.S. antitrust laws, and it is, in fact, what businesses do.

When Microsoft decides how much to sell its software for, it is not basing it on its cost. It is trying to figure out how much money it can make, how many sales it will lose as it raises its prices. That's what the sellers in the California electricity market are doing.

The problem is that we have set up a market where they can raise prices quite a bit without much demand response at all and, because of the technology of electricity, without other sellers able to expand their output.

Let me address two myths about how we got into this. The first myth is that the California crisis is the result of rabid environmentalism in California that blocked the building of new power plants. There is a lot of environmental consciousness in California, and there is no question that the permitting process in California takes a bit longer than it takes in most other States, on the order of months. But this is not a case that California just closed its eyes and refused to build new power plants when they were necessary.

The reason no new power plants were built or started between 1995 and 1998 is because nobody applied to build new power plants during that time. And they did not just apply in California. They did not apply in Arizona. They did not apply in Nevada. They did not apply in Montana or Wyoming or the other parts of the Western grid.

The fact was that the sellers in the Western grid in 1996, 1997, and 1998 believed that the prices in Western United States were going to be low, that there was not going to be a shortage, and that

¹The prepared statement of Mr. Borenstein appears in the Appendix on page 194.

there was not going to be a need for this capacity. They did the economic calculation and they found out that it did not make sense to build power plants at that time.

By late 1998, they figured out they were wrong. Demand was growing and we were facing a tighter market. By the way, most of the demand growth was not in California. It was outside California, but it was all part of the Western grid. And so the market tightened up, and at that point there were plenty of applications. Firms started building power plants. They started trying to get power plants sited. Unfortunately, the process of getting from starting to build a power plant to having the power online is a 4- or 5-year process, and that is why we are still 1 or 2 years away from solving that problem.

The second myth is that wholesale price caps caused these problems in California. California has had wholesale price caps. They were at \$250 throughout most of the market. They were \$750 for a period from October 1999 to June 2000. They were not frequently hit, and during that time, if you look at the rate of return on owning these power plants, it was astronomical. These firms have made plenty of money. There was no period essentially until November 2000 where you could possibly argue that the price caps actually deterred production. In November 2000, we actually did see this happening. In November 2000, the price of natural gas skyrocketed in California, and there was a period of time where it cost \$400 to buy the gas for which you could then sell the power for \$250.

That is the bad old problem with price caps. That is exactly what we had in natural gas. That is exactly what we had in gasoline in the 1970's. That is the danger of price caps. It can happen.

But prior to that, it did not happen and suggesting that firms were not building plants or firms were not producing from those plants is just not supported in the data.

So California now faces two issues, and I think it is important to keep the two issues clear and separate from one another. California and the entire Western grid faces a longer-run problem of building power plants, of getting investment in the West. The market is solving this problem. I think this really is not a major issue. This is the problem of power in summer 2004, and I think the problem of power in summer 2004 is going to solve itself.

The question we are facing now is the problem for power in summer 2001, and telling California at this point to build more power plants is not a solution to that problem. Power plants are not going to get built for this summer. There are only two areas where California can help itself or be helped to get through this summer. One is conservation, and the State has been way too slow to get its conservation plans going. They are now moving on them. We have been way too slow to get real-time pricing in place so that particularly large commercial and industrial consumers would actually see those high prices on hot summer afternoons and would have an incentive to scale back their consumption.

We have not sent price signals and we have not done enough to encourage voluntary conservation. We are moving. We are getting some results. We need a whole lot more results to get through this summer without a major economic crisis.

The other area is the area of price controls. As Professor Kahn said, price controls can be used in a way that would prevent a massive transfer of wealth from consumers to producers without having the adverse effects. The idea of dismissing price controls because they were used, frankly, extremely badly and without much analysis in the 1970's is as silly as the idea of dismissing electricity deregulation because California electricity deregulation has gone awry. Price controls can be used well and carefully. It has to be done extremely carefully. And electricity restructuring can work successfully. We cannot dismiss it based on California's bad experience.

However, I have to say, listening to some of the testimony this morning reminds me of the dangers of price controls. That is, once we go down this road, we are going to have to be careful to recognize what price controls do effectively is control market power. What price controls do in a damaging way is attempt to just control the transfer of wealth in a regular competitive market.

In the 1970's, we tried to control that transfer of wealth in a very competitive market, and we ended up completely screwing up the market and causing shortages. What we need is the analytic capability to tell the difference. Unfortunately, the Federal Energy Regulatory Commission, which came into this deregulation as a legal-oriented process, has not shown the policy skills to do that sort of analysis and as a result has been blindsided by a lot of the economic operation of this market. I think if they had the policy skills to do it, they could implement price caps in a way that would be very carefully done, that would not solve all of the problems—a lot of the problem is a real shortage and real scarcity—but that would solve a significant amount of the problem without causing the sort of damage that price caps did cause in the 1970's.

Thank you.

Chairman LIEBERMAN. Very interesting. Thanks, Dr. Borenstein.

Dr. William Hogan is a professor of public policy and administration at Harvard's Kennedy School of Government, also a research director for the Harvard Electricity Policy Group, which is exploring the issues involved in the transition to a more competitive electricity market. Professor Hogan has also held positions dealing with energy policy analysis in the Federal Energy Administration. We are delighted to have you here, and I look forward to your testimony now.

TESTIMONY OF WILLIAM W. HOGAN, PH.D.,¹ PROFESSOR OF PUBLIC POLICY AND ADMINISTRATION, JOHN F. KENNEDY SCHOOL OF GOVERNMENT, HARVARD UNIVERSITY

Mr. HOGAN. Thank you very much, Mr. Chairman. I have a prepared statement which I would like to submit for the record, but in the few minutes that are available I will summarize the highlights of the initial points I would like to make.

I would emphasize three ideas. First, echoing the comments of my colleague, the diagnosis of what the problems are in California should be the first thing we do in order to understand the rec-

¹The prepared statement of Mr. Hogan appears in the Appendix on page 200.

ommended policies, because different diagnoses lead to different policies.

Second, I would say a few words about the price caps debate, which I think has motivated much of this hearing and the discussion, and to re-emphasize the theme that the details matter. People are talking past each other on this subject.

The third point would be to return to the question of what should be done about market design, which is the long-term and continuing problem in California. I have some suggestions that I will summarize.

The problems in California are quite serious, and they had been serious well before last summer. It is not apparently widely known, but the Federal Energy Regulatory Commission found that the many design features of this market were fundamentally flawed, in their words, in late 1999. So this is not a new problem, but it became much more serious when the prices increased.

Essentially, because of the problems that developed after the summer and the collapse of the market earlier this year, things fundamentally changed as people stopped paying their bills. Market participants were not paying for the power they were taking. Some of the utilities got in financial trouble. One of the utilities went bankrupt. I think the diagnosis of that problem is widely accepted.

This situation was unsustainable and it also tells us what needs to be done to deal with it. First, California should pay its bills in order to re-establish the credibility of transactions. No system can work without creditworthy buyers; and then, further, to provide incentives for conservation, retail prices for incremental energy electricity should be raised to market levels, at least for commercial and industrial customers. Changing the rules and metering to support demand responses would help on many fronts, and I agree with my colleagues on that matter.

Other topics are more controversial, about in particular whether or not the principal cause of the high prices is scarcity or the principal cause is strategic withholding by generators in the exercise of market power. There is a debate about this issue, and unfortunately, this is one of the areas where the debate tends to lead to different policies. It is not so obvious what to do.

Broadly speaking, I think we are talking past each other when we talk about price caps. I would identify three broad ideas that have been suggested. One is a uniform price cap, just setting a cap on the price that will be paid. Second is traditional cost of service regulation where you have a different cost for every plant and you pay them according to those traditional costs. And third comes what are known as bid caps, where you set limits on what each individual plant can bid. It may be different for different plants in different hours, but then everybody gets paid the market-clearing price. There also is a requirement for people to bid.

I will not go into the details now, but I believe uniform price caps would be counterproductive for all the usual reasons. As far as traditional cost of service regulation, trying to reimpose that on the system, it is far from clear how this kind of administrative process could facilitate the market or be implemented in a way that would not exacerbate the immediate problems in the West.

However, to the extent that the problem of high prices results from withholding of supply in order to raise prices, the better solution would be to go to the bid cap approach, which is already in use in other parts of the country as authorized by the Federal Energy Regulatory Commission in PJM, New York, and so on. Under a bid cap generators are required to bid and they cannot bid more than a certain level, which is related to their cost. But unlike with the price cap, the generators would still be paid the market-clearing price. The requirement to supply works in support of a competitive market and would counteract the effect of market power. On the other hand, to the extent that the problem is scarcity, bid caps will not do much to reduce prices. But if scarcity is the problem, then administrative action to reduce prices would probably make conditions worse, not better.

If we are going to intervene, the best of this bad bargain would be to do so with bid caps. This is basically the direction that the Federal Energy Regulatory Commission went to at the end of April with the order that they presented at that time. And I think that is the right direction. There are some fixes that you could put that to make it work better but, nonetheless, I think basically what they are doing is in the right direction.

The problem that I emphasize in my prepared remarks is not dealing with the symptoms of prices and rolling blackouts. The problem that I would emphasize is that the Federal Energy Regulatory Commission has not gone far enough or fast enough in dealing with the market design problems, how to change the basic rules of how the market operates in the West. The details I summarized in my prepared remarks reduce to a simple prescription. Namely, the market for the West should be set up to emulate that which is working so well in the East, in the PJM system, in New York, and is soon to be adopted in New England. These systems are not perfect, but they are the best systems that we know about, and they are much different than what California adopted.

Market design is not necessarily the cause of the high prices, but it constitutes another set of problems which are fundamental and have been ignored or delayed, as everybody is worried about the symptoms of high prices and blackouts. It is time to move on, because we are running out of time if we want to see electricity restructuring work.

Thank you.

Chairman LIEBERMAN. Thanks, Dr. Hogan. I feel like I am going back to Economics 101. It has been very helpful, and this brings me logically to Dr. Joskow, who is engaged in teaching and research at the Massachusetts Institute of Technology in the areas of industrial organization energy and environmental economics and government regulation of industry. Dr. Joskow has been focused on the competitive electricity markets for over 20 years and in that time has published five books and over 100 articles and papers.

Senator Thompson, in the interest of full disclosure, I do want to reveal that while a graduate student at Yale in 1970, Dr. Joskow was a very important volunteer in my very first campaign for the state Senate. [Laughter.]

Is that where you learned your economics?

Chairman LIEBERMAN. That is why I mentioned Economics 101.

Dr. Joskow, nice to see you.

TESTIMONY OF PAUL L. JOSKOW, PH.D.,¹ DIRECTOR, CENTER FOR ENERGY AND ENVIRONMENTAL POLICY RESEARCH, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Mr. JOSKOW. Thank you, Senator Lieberman, Senator Thompson. It is a pleasure to be here. Actually, my job on that campaign was to be a poll watcher and make sure that people who died in the past 2 years did not vote.

Senator THOMPSON. We should have had him for our prior hearing.

Chairman LIEBERMAN. You are a very valuable witness in most matters this Committee is interested in.

Mr. JOSKOW. I have a prepared statement that covers a number of issues related to FERC's responsibilities and performance across the country. In my oral remarks, however, I would like to focus on California.

The causes of California's electricity crisis are complex, reflecting a combination of bad market design, bad regulatory decisions, unanticipated changes in gas prices and other supply and demand conditions, credit problems, and, I believe, supplier behavior which rationally took advantage of opportunities created by these conditions to further increase market prices above competitive levels.

I would like to agree with Senator Thompson. These problems did not start on January 21, 2001. Indeed, they did not start in 2000. The first problems in California's markets began to emerge as early as July 1998, and in my view, the events of the past year were an accident waiting to happen.

Some progress has certainly been made in the last year. However, I continue to believe that both Federal and State officials can and should do more to deal with the immediate problems and to make longer-run reforms in California's wholesale and retail market institutions. While wholesale electricity market problems have been most severe in California, they are not unique to California. I think it is important for the Committee to understand that. There have been market performance problems requiring a variety of reforms and mitigation measures in the new wholesale markets in New York, New England, and the Pennsylvania-New Jersey-Maryland pool as well.

And this should not be surprising. Electricity has unusual physical attributes that make the design of well-functioning competitive wholesale markets a significant technical challenge. Spot markets perform especially poorly when supplies are tight, demand is completely inelastic, and a large fraction of demand is served out of the spot market.

Midcourse corrections have frequently been necessary after competitive electricity markets first go into operation. Price caps, bidding rules, cost-based contracts, and a variety of other mitigation mechanisms have been used and are being used in most new wholesale electricity markets in the United States and other countries. I must say some of the recent discussion about "price caps"

¹The prepared statement of Mr. Joskow with an attachment appears in the Appendix on page 351.

is a bit of a mystery to me because we have been using them for several years.

In this regard, the term “price caps” has become so ideologically loaded and means so many different things to different people, I think we should just use a different term. My concern is not that wholesale prices are high per se. My concern is that prices are significantly above competitive levels because of a variety of market failures. What I would like to see is a comprehensive, short-run market failure mitigation program, not rigid uniform price caps, combined with a longer-term program to fix market design and regulatory flaws. You can call it anything you want—price mitigation, since Fred Kahn is here, let’s call it a banana. The issue is to move forward.

Of course, we need to be sensitive to the possibility that mitigation measures can make things worse rather than better if they are poorly designed. Of course, we want to use mitigation mechanisms that do not discourage new investment in generating facilities. Of course, the proper long-run strategy is to fix the market and regulatory institutions that are broken. But we also must be concerned about the interim cost to consumers and the economy of unmitigated market failures.

Despite the recent break in wholesale prices in the West—and I would be happy to answer questions about that if you have questions—I remain concerned that hot weather plant breakdowns, reduced hydroelectric supplies, and remaining market design flaws are likely again to present conditions that create the incentive and opportunity for suppliers to engage in behavior that increases prices significantly above competitive levels this coming summer. It is this potential problem that should be the focus of immediate mitigation efforts while we continue to focus on longer-term fixes.

As Senator Thompson observed, the summer is now upon us. The practical mitigation options for this summer are, therefore, quite limited. FERC did put in place a supply and price mitigation protocol in California on May 29, and I will not call it price caps, price mitigation. Let’s see if we can build on it.

I would like to see FERC extend the number of hours to which these mitigation rules apply to all summer hours, 7 by 24. I would like to see it identify and close remaining loopholes available to resellers, and I think very importantly to find ways to integrate suppliers in other Western States into this mitigation program.

I do not think this is going to be easy. I do not think it will be successful if FERC follows its usual course in applying these mechanisms. But I think it can be done if FERC staff and the control area operators in the West work together to make it happen.

I also would continue to urge California officials to continue their efforts to remove unnecessary barriers to the construction of new generating plants, if any still exist, to raise retail prices to reflect wholesale market prices, to implement real-time pricing, to restore credit to the system, and to continue energy efficiency and conservation efforts.

Thank you. I would be happy to answer any questions you have.

Chairman LIEBERMAN. Thank you, Dr. Joskow. Thank you very much. Right on time, too.

Dr. Lawrence Makovich is senior director of Cambridge Energy Resource Associates, an energy consulting firm started by Daniel Yergen, who many of us have been pleased to know and worked with over the years. Dr. Makovich is an expert on electricity markets regulation, economics, and strategies, the author of several reports and articles on the future of the electric power business, and a lecturer on managerial economics at Northeastern University's Graduate School of Business.

A pleasure to have you here.

Senator STEVENS. Mr. Chairman, do we have a copy of his statement?

Dr. MAKOVICH. I did submit a copy of the statement, yes.

Chairman LIEBERMAN. He did. We can get you one.

Go right ahead, Dr. Makovich.

TESTIMONY OF LAWRENCE J. MAKOVICH, PH.D.,¹ SENIOR DIRECTOR AND COHEAD, NORTH AMERICAN ENERGY GROUP, CAMBRIDGE ENERGY RESEARCH ASSOCIATES

Mr. MAKOVICH. Power prices in California are too high because the power market has a real shortage caused by serious structural flaws in the market design and in its implementation. California did not follow the example of other power markets that use rules to create a market for capacity. In addition, California's complex siting and permitting processes have created formidable barriers to the development of new generating capacity that the State so badly needs. Quite simply, California ran out of capacity because it did not set up a market to pay for it or a process to enable it.

A third flaw in the California market design was the use of price caps in retail power rates. As scarcity drove up wholesale power prices in 2000, the majority of customers in California continued to consume power at price levels frozen at 1996 levels. The retail price caps distorted the market by increasing demand and driving price spikes higher. Yet utilities remained obligated to provide all the power people wanted at capped prices. As a result, price caps had the unintended consequence of driving Pacific Gas and Electric, California's largest utility with \$22 billion of assets, from an A credit rating to bankruptcy court in less than 4 months.

Of course, the bankruptcy also distorted the market by making suppliers reluctant to buy fuel and produce power to deliver to someone who was not likely to pay for it. Price caps, although well intentioned, usually distort the market and create unintended consequences. We have already seen this in California, and the history of price controls is a record of distortion and unintended consequences.

Price caps may sound simple in theory, but, in fact, they are anything but simple. The bureaucracy to administer them always becomes many more times complicated than originally expected.

Now, many people want price caps because they believe that power suppliers are withholding capacity to drive up prices. If this were true, then price caps would limit their gains. Further, this argument goes, if we could just get them to knock it off, then this

¹The prepared statement of Mr. Makovich appears in the Appendix on page 365.

artificial shortage would end and power prices would drop back down to reasonable levels.

Why do so many people want to believe in market power? Putting the blame on suppliers diverts blame from the basic design flaws and weaknesses in the current California power market. An examination of the California power market does not support the market power hypothesis. Power generators have market power if they can act to set prices; however, high prices alone can occur for many other reasons as well.

The California power exchange began operation in 1998. In anticipation of this, we developed a computer model in CERA to analyze the interaction of supply and demand in the determination of prices. When we simulate the Western power markets in 1998 and 1999 and compare the results to the actual market-clearing prices, the evidence is quite compelling. During this period the California power market was in a demand and supply balance, and we observe that wholesale power prices cleared at the level of short-run operating costs—fuel, environmental costs—

Chairman LIEBERMAN. What time periods was that, Doctor?

Mr. MAKOVICH. This is 1998 and 1999.

Chairman LIEBERMAN. Thanks.

Mr. MAKOVICH. Fuel, environmental costs, and other operation and maintenance costs.

Over this time frame, the California energy market was doing just what it ought to do: Efficiently determining the utilization of power plants to meet demand at each hour with price signals reflecting the operating costs of rival producers.

We must confront the fact that the industry structure that delivered a competitive outcome in 1998 and 1999 did not change in 2000. What did change was the demand and supply balance. Since no significant generation additions were made, demand finally outstripped supply. Any market with a severe shortage of a commodity that customers value highly and have few substitutes for will end up with buyers' bidding up scarce supply—in other words, a shortage or scarcity premium.

We must recognize that when supply and demand were in balance, the competitive energy market in California produced prices with a level and volatility that was half of what was necessary to support new power plant development. During 1998 and 1999, the annual wholesale power price of power was between \$14 and \$30 a megawatt hour. The evidence is clear. The energy market alone in California did not provide a timely price signal for new investment. As a result, the shortage was both predictable and preventable, and as early as April 1997, CERA published a report predicting just that.

Other markets have capacity markets along with energy markets—like Texas and New England—and they have been able to attract more than enough power investment in just a few years to avoid similar shortages. We must face the fact that California competes with other power systems around the world to attract power plant investment and price caps discourage investment. Remember, the power business is one of the most capital-intensive businesses in U.S. economy. California remains a highly flawed power market in which the only way to recover costs above short-run operating

costs is through a periodic shortage premium. By adding price caps to the current flawed California market design, investors will see no way to recover the full cost of power investment through the market. California cannot afford to continue to bring forth power development by guaranteeing payment through long-term power purchase contracts from the Department of Water Resources. The State's record in long-term power contracting is abysmal. Remember, half the stranded costs in California that drove the State to deregulate were due to long-term power contracts the State mandated under the Public Utility Regulatory Policy Act. California has not fixed its market to create a positive investment climate for power development. To assist California, the FERC should insist on a minimum set of structural elements in its wholesale market design. It will be a mistake to make price caps the centerpiece of a Federal response to the California power shortage. They would make a bad situation worse, and they do nothing to fix the flaws that so desperately cry out for solution.

Thank you.

Chairman LIEBERMAN. Thanks, Dr. Makovich. Thanks for your testimony.

And, finally, Dr. Frank Wolak, whose impressive credentials I will describe now. Dr. Wolak specializes in industrial organization and economic theory at Stanford University where he is professor in the economics department. His recent work studies methods of introducing competition into infrastructure industries and assessing impacts of this competition policies on consumer and producer welfare.

Dr. Wolak is also notably the chairman of the Market Surveillance Committee of the California Independent System Operator and, therefore, again, right in the middle of the California crisis. Thanks for being here.

**TESTIMONY OF FRANK A. WOLAK, PH.D.,¹ PROFESSOR,
DEPARTMENT OF ECONOMICS, STANFORD UNIVERSITY**

Mr. WOLAK. Thank you very much. I would like to focus my remarks on a specific issue, and that is really the design of what I will call—Paul Joskow called it bananas. I will call it regulatory interventions required under the Federal Power Act to protect consumers from unjust and unreasonable wholesale electricity rates.

First, I would like to state the two goals of regulatory intervention, and then I will briefly explain why I believe that the plan recently implemented by the Federal Energy Regulatory Commission will fail to achieve these goals. And, finally, I will just summarize the plan that has been proposed by the Market Surveillance Committee in its December 2000 report to FERC, which I do believe satisfies the goals.

The first goal of market power mitigation is to reduce the average wholesale price that California pays to a level that would occur in a competitive electricity market, given California's current supply and demand conditions and the cost of input fuels. And any successful market power mitigation plan has to guarantee that it can at least satisfy this goal.

¹The prepared statement of Mr. Wolak appears in the Appendix on page 371.

The second goal of a market power mitigation plan is also, I think, very important, to alter the incentives faced by the market participants so that it will no longer be profit maximizing for generators to essentially withhold capacity from the spot market by bidding substantially in excess of the variable cost of producing electricity from their facilities. The idea is essentially to alter the rules in such a way that, post-intervention, spot market functions in a manner that is consistent with the competitive market in the vast majority of the hours.

I believe the market power mitigation plan that has been recently implemented by FERC is very unlikely to achieve these goals. In the first place, the plan provides for no mitigation during hours without system emergencies, and unfortunately, as has been noted by a study prepared by the Department of Market Analysis at the ISO as well as my own work with Severin Borenstein and Jane Bushnell at the University of California Energy Institute, the majority of overpayment due to the exercise of market power occurred during the hours when there were no system emergencies. Consequently, this market power mitigation plan currently fails to address the greatest source of the unjust and unreasonable prices in the California electricity market noted by the Federal Energy Regulatory Commission in its November and December 2001 orders.

So even if this mitigation plan was extended to all hours, it still has the potential to be virtually ineffective at mitigating market power. For example, the plan only requires generators give all their uncommitted capacity into the ISO's real-time energy market at what is called a proxy bid price, which is computed by ISO to essentially account for the heat rate of the unit, the price of natural gas, and the price of other inputs that the firm might use.

However, a very straightforward way for generators to avoid this requirement, is simply to sell its energy in advance to a power marketer, and then even if this firm sells its energy to an affiliated power marketer, that will satisfy the condition that FERC now has to saying the capacity is committed, and therefore not subject to the mitigation measure.

So this aspect of the FERC plan creates a very simple strategy for a generation owner to essentially obtain higher prices. The firm simply sells its energy to an entity located outside the State on a day-ahead basis. This effectively commits the capacity, so it is no longer subject to the real-time bid rule. Then in real-time market approaches, the ISO discovers it is short of electricity in California, and must find some out-of-state producer to sell into the market. Under these circumstances, the out-of-state suppliers can effectively bid whatever they wish into the ISO's real-time energy market, because they certainly have the option of not supplying energy into California if they do not receive the price they want. And through this process, a generator located in California can effectively achieve significantly higher prices than what are certainly seen to be envisioned by the mitigation plan by selling outside of the State at a high price, knowing that in all likelihood, this power will be sold back into the State in real time when the ISO calls the out-of-state supplier to produce more energy, because as all market

participants know, California is a net importer of energy, and this is particularly the case in the summer months.

And to give some idea of the potential profitability of this activity, it is not unusual for a megawatt delivered to California to trade between 5 to 10 times in the forward market before it is actually consumed. So a second aspect of the order that I think will render it ineffective, even if it is applied to all hours, is that generators still have the ability to receive their justifiable costs, rather than the market-clearing price computed by the ISO using the generator's proxy bid prices. So, for example, if a generator's proxy bid price is computed by the ISO to be \$50, and if this unit is necessary to serve demand and it bids its cost-justified bid of \$150, if the bid is necessary to serve demand, the generator will be paid its bid for \$150 for the energy supplied, not the \$50 per megawatt proxy bid market clearing price.

So, consequently, even though the market-clearing prices posted on the ISO website would say \$50, generators can receive substantially in excess of this market clearing price if they are willing to cost justify their bids in the ISO's real-time energy market. And given FERC's unwillingness to order significant refunds from generators and their use of a methodology that is exceedingly generous to generators in determining the recoverable production cost, it is no surprise that right now many generators are currently submitting bids that are accepted and paid as bid at prices significantly higher than the market-clearing price set by FERC under its recently implemented market power mitigation plan.

So this provision for paying as bid for energy is very similar to the \$150 soft-cap policy, which was implemented in 2001. This policy said that all bids in excess of \$150 had to be cost justified, and if necessary to serve demand, they would be paid as bid. And during the period July 1, 2001 to May 1, 2001, even though there was \$150 soft price cap in place, average prices in the ISO's real-time market were in excess of \$250 per megawatt hour. So this guarantee by FERC in its former soft-cap regime, and in this recently implemented mitigation plan to pay as bid any cost-justified bids, as I think the best illustration of the point that cost of service regulation, which is essentially what the soft-cap policy is, without a prudence requirement, is the equivalent to no regulation at all. Unless FERC seriously investigates the prudence of these claims cost, something it did not do during the former soft-cap regime, the current mitigation plan will once again return California to a world without effective market power mitigation.

And the final aspect of the FERC mitigation plan is that if it were applied to all hours, and even if these two problems described above were solved, it is extremely unlikely to achieve the second goal of market power mitigation, because it just does nothing to alter the incentives of generators to bid aggressively in the spot market and to maintain their units in top working order. This is effectively the point made by Senator Feinstein. In fact, on the contrary, the plan creates strong incentives for generators to declare forced outages and planned outages of their low-cost units so these units will not set the market-clearing price, but instead, their higher cost units will more frequently set the market-clearing price that is earned by all the units.

And, so, moreover, this mitigation plan creates incentives for generators both in and out of California to sell outside the State for the reasons discussed above, so consequently, the FERC plan has the potential of creating the worst of both worlds for California, a less reliable grid, because generators do not want to sell into California and have little incentive to maintain their plants, and high prices because it is very easy to cost justify virtually anything with no serious prudence review on the cost incurred.

And just to finish up, the December 1 Market Surveillance Committee Report presents a plan which I think can achieve both of these goals, and this remedy does not impose a soft cap on the spot market, but it does require FERC to make a one-time regulatory intervention that results in just and reasonable rates in California for the next 2 years. The essence of this plan is that all sellers in California would be ineligible to continue to receive market-based rates only if they offer 75 to 80 percent of their expected annual sales in the form of a 2-year forward contract at a price set equal to the perfectly competitive benchmark over this time period. This after all is market-clearing price that the FERC no-market-power standard explicitly stated in its competitive market requirement for a participant to receive market-based rates. So consequently, with this mitigation measure in place, the firm still has a significant upside potential, but California consumers are protected from the significant volatility in the spot market for at least 75 percent of their sales, and moreover, this plan will create the incentives for generators to be aggressive competitors in the spot market, to maintain their plants in top working order, and the other advantage of it is, it is simply a one-time intervention, and has no danger of essentially, once implemented, remaining in place. Thank you very much.

Chairman LIEBERMAN. Thank you Dr. Wolak. Thanks to all of you for very interesting and thoughtful and helpful testimony. You have come from different places. In fact, four of you were asked by the majority, two by the minority.

Generally speaking, it sounds to me that though there may be some disagreement on what action FERC should take, just about all of you agree there should be some price mitigation action, although I do want to give you a chance to clarify, Dr. Makovich, because at the end of your statement, you spoke out strongly against price caps. Do you think there is any role here for FERC to play in what Dr. Joskow and others have called price mitigation in the Western markets now?

Mr. MAKOVICH. The price mitigation idea, as Dr. Wolak has said, there is this opportunity to get around it with the power traders. There is also a problem here that half of the power produced in the west is not under FERC jurisdiction. So on a practical basis, it is hard to imagine that this kind of bid capping or price mitigation is really going to work, given the reality of the jurisdiction limits out there and the ways to end run this set of regulations.

Chairman LIEBERMAN. So what would your answer be to folks in California who say that prices are too high; in a year and a half, supply is going to equal demand because of the power plants that are coming online; we have done all we can in California; the power plants are moving again; conservation is working, we are 11 per-

cent down; but we need the Federal Government, through FERC, to come in and do something for us in the short-term, temporary price lease. What would you say in response to somebody from California who asked you that?

Mr. MAKOVICH. Well, there is a number of things that needed to be done in the short run, some of which were not done. So the price increases that we have seen were important, but they are very uneven. We have yet to—

Chairman LIEBERMAN. Things not done by FERC, you mean?

Mr. MAKOVICH. The retail pricing pieces. What has not been done in the short run is there should have been more done to bring additional supply in for this summer. And people say, well, it takes 4 years to build a power plant. But the truth is, I know people that can build barge-based emergency power systems in the Houston ship channel, and within several months could have that power plant—they could have hundreds of megawatts of additional supply in various locations through California. There were proposals to do that last year. Those proposals were denied. There are, according to the California Energy Commission, 5,000 megawatts of emergency backup generation that we have never taken the legal and environmental restrictions off temporarily to coordinate that supply to have it available for this summer to help meet these demands. So there are a lot of things that can still be done in the short run, short of price caps, to help mitigate the blackouts that are coming.

Chairman LIEBERMAN. Dr. Borenstein, would you like to respond to that?

Mr. BORENSTEIN. Yes, I would like to respond to a number of things. First of all, I think Dr. Makovich did not hear the news, that in the last couple of days, there has been a lifting of a lot of the environmental restrictions, and so a lot of those backup generators are going to be allowed to run.

Chairman LIEBERMAN. By the State.

Mr. BORENSTEIN. By the State. They are heavy polluters and that is certainly not the way I would go. If I ever asked beyond price caps what the State should be doing, is pushing much, much harder on conservation than we are pushing. We still have buildings air conditioned to the point that people need sweaters, and that is just crazy, given the situation.

I think it is really not accurate or at least not relevant to say that half of the power produced in the west is not FERC jurisdiction. Most of that is public power. In the case of municipals, who produce their own power, those are not—they generally are not ones exercising market power. It depends on their net import or net export position. Most of that power is produced by public utilities who are just consuming their own power. So I think the argument that there is a lot of power you could not control, is not a reason to implement price mitigation. It is true that demand has outstripped supply, but I really have to say, if Dr. Makovich's company is advising companies and telling them that you cannot exercise market power in this market, they need a refund, because if you are in this market, and you own 4,000 megawatts of capacity in California, and you cannot exercise market power, you are not paying attention. It is really pretty straightforward. It is something that many of us pointed out before the market even opened. It is

something that we have interacted with people at these companies, who are certainly aware of their ability to do it. They have argued that they are not doing it, but I think that if that is the case, it is out of benevolence, which is not how capitalist systems actually work well.

Chairman LIEBERMAN. Let me ask one or more of the five of you, who have advocated some sort of price relief by FERC on a temporary basis, to respond—there was some mention of it, but I would like to hear a little bit more about it—to respond to the argument that price relief or price caps—although that is a bad term; price relief or mitigation is better—if they are imposed, they are going to cut off supply by reducing the incentive for new power and new power plants by intervening in the market in that way.

Dr. Kahn, what is wrong with that argument?

Mr. KAHN. The whole history of regulation of the electric power industry has been one in which the effective regulation on capacity has always been deemed to be one of encouraging excessive expansion of capacity. There is no reason why, if you set rates that insure an operator return on investment that is sufficiently high to do so, that it will discourage construction of new capacity. And it seems to be it is very useful to look in history. People just say it and say it and say it, but I was never aware of any contention—I was chairman of the New York Public Service Commission and studied this for 50 years—that anyone has ever argued that had the effect of retarding investment. On the contrary, it is a very well-known phenomenon, which Paul Joskow has studied, and it is not always empirically demonstrable, but I have never seen anybody argue it had the opposite effect. The only thing that had the opposite effect was, of course, the uncertainty in the 1990's about what was going to happen.

Mr. JOSKOW. Senator Lieberman, let me take a crack at this. I think the greatest danger right now to new investment in California and the rest of the west is the continuing chaos in the markets out there and the uncertainties about public policy. The price mitigation programs that have been proposed by a variety of different people, yield prices that make it very profitable for new efficient generating plants to enter the market. Those plants lined up for permits back in 1998 when prices were very low. The new plants are 30 percent more efficient thermally than the existing plants. They emit a tenth of the nitrous oxide of the existing plants. There are just enormous incentives, once those plants can get licensed, to come in to the market, and many of them are being built in California, and in Arizona, and in Nevada. So if this is done effectively I think it will in fact, make it easier for investors to commit resources to the west because they will have a stable market and regulatory environment against which to shoot at.

Chairman LIEBERMAN. Let me just say it is an important point, because we hear this in a host of different economic areas here in Congress. The business community is always asking for stability, predictability to base their judgments on. But as both of you are saying, obviously, a price mitigation will, under anybody's vision of it, preserve a healthy profit margin for the producer. So, presumably the market will still be there, sufficient to encourage them,

particular with the stability and predictability we are talking about, to get into the business, which they are.

Mr. JOSKOW. Yes, indeed, and there is a very good study that has been done by an economist at the California ISO, Eric Hildebrand, which looks at exactly this question, if we kept prices at the competitive levels that a number of us have simulated, there is still a very healthy margin for new investors. I would like to get us out of the game of placing blame, of demonizing the suppliers, to recognize we have to do something in the short run to keep the system from going out of control, make long-run fixes, but to provide a stable regulatory and economic environment for new investors to invest in. I think that is substantially more important than continuing what I think will be continuing chaos and the blame game over the next 18 months if we do not take effective action now.

Chairman LIEBERMAN. Dr. Wolak, did you want to say something?

Mr. WOLAK. I just wanted to add something following up on what Paul Joskow said. I think it is very important to bear in mind the time lag that it effectively takes in a decision maker deciding whether or not to build new capacity. What he is interested in is not the prices right now, not the prices a year from now, not the prices even 18 months to 2 years from now, but the prices after the period when the plant is in the ground and producing.

So following on what Paul Joskow said, if what we—the fear I think of many firms is, what will happen in California if we go through this summer and it is a complete implosion, then it will be public power or whatever strange solution comes out of the California initiative process and that will be the sort of thing that I think will chase all investment away, because of the fact that it takes 2 years to build a power plant. So high prices now do nothing to signal new investment to come into the market. It is the expectation of high prices 2 years from now to 3 years from now, when that plant is in the ground and operating, that cause me, as a rational firm, to invest in the market. All you are doing by mitigating prices within the interim 2-year period, is simply just not distorting any investment decisions, but just reducing essentially the punishment, as Professor Kahn said, that consumers have to bear during that period.

Chairman LIEBERMAN. Thanks. My time is up. Senator Thompson.

Senator THOMPSON. Thank you very much Mr. Chairman. This is a great panel, because we have so many people who are so much more knowledgeable than we are, and it is always good when we are struggling to try to keep up. I think maybe we are making progress.

But on that point of investment, and listening to you talk about that, it sounds like a rosy scenario compared with some of the things we have heard from some people involved in the activity. In a June 11 letter,¹ Bear, Stearns' senior managing director and chief economist Wayne Angell writes that price controls are a recipe for disaster. He goes ahead and makes the usual points, I guess, con-

¹Letter from Wayne D. Angell, Bear, Stearns and Co., Inc., dated June 11, 2001 appears in the Appendix on page 556.

cerning price control, but he says the confidence in the investment community has already been severely damaged by California's regulatory policies, and it will take time to repair the damage and regain credibility with investors. The worst thing regulators could do at this time would be to impose still more controls. A prepared statement of June 13 from William C. Dudley,² chief U.S. economist, Goldman, Sachs; he says that price caps would deter the type of investment in electric power generation and transmission capacity that the State of California seeks to encourage. The risk would rise because the imposition of price caps is by nature arbitrary as to level, timing and duration. If caps were imposed, this would increase investor anxiety that the caps could in the future be lowered, broadened, extended, in terms of duration. He says, "In my view, the solution to the California energy crisis lies not in price caps, but in encouraging the installation of additional electric power generation and transmission capacity, and imposition of price caps work against this." We may be comparing apples and oranges here, but I would ask that these two statements to be made a part of the record here.

Chairman LIEBERMAN. Without objection.

Senator THOMPSON. People in the community are concerned about the attractiveness of California in the current environment as far as future investment is concerned. It seems to me that it is important to understand the nature of the problem, complex in some respects, not so complex in others, perhaps. It seems from all of you have said, and other experts have said, that we do in fact have a system, that is not working and from the very beginning, had inherent flaws: Retail caps, which went against our need for conservation; utilities with no ability to enter into long-term contracts, had to operate on the spot market, which looked good at the time, and, well, looks good today, as I understand. Now that California has gone to long-term contracts, the spot market is down. So they are buying high and selling low in both respects. Insufficient capacity, perhaps insufficient infrastructure, weather, all these problems come together. But in looking at all of that, and listening to these comments, would anyone disagree with the proposition, that as a part of this mix, California needs to allow retail prices to rise more and be more consistent with the actual cost?

Mr. Kahn, if I understood you correctly, you referred to ridiculous freezing of retail prices. Mr. Borenstein, you talked about the need for conservation. I do not see how we can get there without that. Does anyone disagree with California's need to do that?

Mr. WOLAK. I think it is important to make the distinction between the cost, prices that reflect cost versus prices that reflect what people offer the power at. So I do not think anyone would disagree that prices that reflect cost should be passed on to consumers. The big debate is over exactly the extent to which the prices that are currently being charged in the market, are reflective of cost, because of the fact that there is the standard under the Federal Power Act that says that rates must be just and reasonable, and one way to obtain just and reasonable rates is rates

² Prepared statement from William C. Dudley, Goldman, Sachs and Co., appears in the Appendix on page 558.

that recover costs, and as I said with the various studies that have been done by the various members of the panel here—

Senator THOMPSON. Even if the retail prices were what you feel like they ought to be, without the influence of market power, would you still not agree that the idea of retail caps was a bad one?

Mr. WOLAK. I think the other thing to remember with the retail caps is this is not something that is unique to California. This exists in every market that has been restructured in the United States. The other thing that I think is important to remember from the retail caps—

Senator THOMPSON. Retail caps, letting alone the wholesale prices—

Mr. WOLAK. Fluctuating wholesale prices and—

Senator THOMPSON [continuing]. And caps along these lines?

Mr. WOLAK. Yes, it exists in PJM, New England, New York. It is just the only difference is, is the extent to which there is an outstanding position on the part of the retailer to sell the power to purchase from the spot market. And the other markets, the extent to which they have to—if you like their net short for energy—is much less. They own significant amounts of generation capacity to meet their own loan obligations, whereas California, because of the divestiture, had large amounts of net short, and that really is a major source of the problem.

Senator THOMPSON. These other States that have deregulated, for example, have allowed long-term purchases, have they not?

Mr. WOLAK. Yes. California did as well. It is just that—the unfortunate thing is that California allowed the investor-owned utilities to do that. It is just that the incentives that the investor-owned utilities faced at the time were such that it was a good deal not to engage in long-term contracts, so it is not an explicit prohibition.

Senator THOMPSON. Mr. Kahn, would you comment about the efficacy of these price caps?

Mr. KAHN. Yes. Two things. One, looking at it now, of course, it is clear that the imposition of rigid retail caps was a mistake. At the time, it may have seemed a reasonable bargain, because you will remember that 4 or 5 years ago, the main concern was that the distribution companies, the big electric utilities, would be left with stranded costs. That is, the cost of over investment in capacity, the cost of those huge contracts that they were forced to buy at artificially-set prices, and so at the time, it looked like a bargain. You give us the assurance that we will be able to recover our stranded costs. In exchange, we will freeze retail prices. So we have to be a little bit gentle. The fact is, after the fact it has proved to be a catastrophe from the point of view of the companies who in effect—

Senator THOMPSON. There comes a point in time in which public officials, theoretically, should be able to perceive that it was a bad idea.

Mr. KAHN. I think that is right.

Senator THOMPSON. Mr. Makovich, do you have a comment?

Mr. MAKOVICH. Well, I think the idea that this problem can be solved simply by long-term contracting is one that is also a fairly dangerous idea. There is a couple of problems there. One is, suppose we got 80 percent of people to voluntarily contract long run

of their demand in California. If then we rely on the spot market to supply the rest of it, and people will not build on the basis of the spot market, which we have already seen, and we come up short again. We do not have the capability to cut off the customers that are covered under long-term contracts versus those that are not. So there is an enforcement problem here, because when we shed electric customers in a blackout situation, we shed circuits. We do not differentiate one customer to the next.

Second, if long-term contracts are the solution, and they keep the market in balance because the price is high enough to cover all the cost of a new power plant, power marketers are going to attack them because they are going to be able to buy on the spot market that clears on short-run costs, and they are going to be able to have a short position, sell long term—

Senator THOMPSON. You are getting a little down into the weeds for me. [Laughter.]

Mr. MAKOVICH. Right.

Senator THOMPSON. I am not making a case for long-term or spot. I assume you need both. What I am trying to get at is a decent analysis of the structural situation that underlies this and presents the problem.

Mr. MAKOVICH. Suffice it to say, long-term contracts alone will not solve the problem we have in California.

Mr. BORENSTEIN. If I can answer on retail rates, I very much agree with you, and we were very slow in California to raise retail rates, and I am fearful that as the bills arrive in the next few weeks, particularly residential customers are going to find out their bills did not go up very much because they did not on average. But I think it is important to recognize that electricity is not a storable good. The cost of providing electricity is something that varies hour to hour tremendously, even in a completely competitive market.

Senator THOMPSON. So these great spikes we see, I understand, are just momentary.

Mr. BORENSTEIN. Right. We have deregulated the supply side of the market and have not deregulated the demand side of the market in the way we really need to to make that work, and that is with real-time pricing. That is, prices that are sent through reflecting the rate, the real rates. If all we do is just raise the flat retail price you are going to be facing an incredibly high price in the middle of the night which is way too high, and the same price on a hot summer afternoon when it is way too low. What the real mistake California did on the retail rate is not the freeze, I would say, although I think that is a big part of the problem, it is that we did not get to pricing on the retail side that really reflects the scarcity.

Senator THOMPSON. Can I impose on the Chairman, and ask Mr. Joskow to respond to that also?

Chairman LIEBERMAN. Sure.

Mr. JOSKOW. I agree completely with Mr. Borenstein, who by the way, was my student. I think California was too slow in increasing retail rates, but I also think it is important to make these markets work, that at least some significant fraction of demand be on real-time prices.

Just to give you an example from June 2000. On June 8, the demand was low and the price was \$50. On June 13, 2000, demand

spiked and the price went up to \$750. You cannot respond to that if you are not seeing those prices, and if you get your bill a month later that tells you that you paid that. One of the things that makes markets work is that consumers can say no when they see a high price. If you go into a restaurant and you see on the menu that a hamburger is \$85, you say I am not going to have a hamburger. I will have a tuna sandwich, or I will have a salad. You cannot do that now in these electricity markets, and they are just not going to work until we implement these kinds of strategies.

We have made a lot of mistakes. There is a lot of blame to go around, not just in the west. In New England, in New York and PJM, this was much harder to do than a lot of people thought. We need State and Federal regulators to work together to fix these problems, not just in California, but elsewhere in the country, and I think that really is the big issue, not finding blame. There is plenty of blame to go around. But to get FERC, to get the State commissions, to get the reliability councils together to make the system work in the short run and the long run. I think we can mitigate prices in California this summer if we take that approach. I agree with Frank Wolak. It would have been better if they had followed advice that was given to them by the Market Surveillance Committee last summer. But FERC essentially ignored the Market Surveillance Committee. But here we are. It is June 13. The summer is upon us. We have got to work quickly together to get us through this summer and probably next summer, while we do not forget that we need to fix the longer run problems as well.

Mr. KAHN. This is not a new idea, 25 years ago the price of electric power on Long Island was 5 cents a kilowatt hour, morning, afternoon, evening, summer, fall, winter, and spring. By the time I left, we had all big commercial and industrial consumers on time-of-day meters, and the prices ranged from 2.5 cents at night to 30 cents when the thermometer got above 84 degrees. That was 1976.

Mr. JOSKOW. Fred was being modest when he said he knew nothing about electricity. He was the chairman of the Public Service Commission in New York, and in fact, implemented these ideas in New York State.

Chairman LIEBERMAN. Thank you both. Senator Carnahan.

OPENING STATEMENT OF SENATOR CARNAHAN

Senator CARNAHAN. Yes, thank you, Mr. Chairman.

I realize that our topic today is about energy in California, but I want you to know that the people of Missouri are very concerned about the energy picture as well. They have watched as the crisis has unfolded in California, and they have worried also as their own fuel prices have spiraled. I have heard from a number of people whose natural gas bills have doubled, and in some cases tripled, just since last winter. Many of them are seniors on fixed incomes and working families who are barely making ends meet.

So as we talk about the economics of the electricity industry today, we should be mindful that this discussion is about far more than just competing theories. And it is about more than beliefs in free markets. It is about the everyday lives of real people and the impact that our decisions have on them.

The price spikes in many States, combined with the crisis in California, and the current debate about a national energy policy, have caused confusion and anger all across America. In the past, most of us purchased our electricity from a single regulated utility. State agencies determined the utility's cost in producing the electricity, added a reasonable profit, and set the price charged to consumers. Changes in the electricity industry, including technology, have allowed us to consider new deregulated systems. Under such a system, consumers would choose from whom they wished to buy electricity. Many have argued that competition should lead to lower prices, but California's experiment with deregulation has caused serious doubts among many Americans.

Whatever the original cause, California's problems have been compounded by the hands-off approach of FERC. Instead of vibrant competition, California has suffered from shortages and skyrocketing prices.

Does this mean that deregulation is bad policy? No. We may very well conclude that the best interest of the American people are served by deregulated electricity industry, but I think we must ask a very fundamental question. Is a deregulated market the same thing as a competitive market? I think California's experience shows us that the answer is clearly no.

Obviously, the deregulation must be approached with caution. The transition from a regulated industry to a competitive model is a process that will require a willingness to make adjustments. When the initial approach proves unworkable, corrections must be made. During that transition, we must ensure that someone has both the legal authority and the will to look out for the purchasers of electricity. Thus far, the sellers have proved adept at protecting their own interest.

Undoubtedly, as academics, each of you will continue to study the wisdom of California's approach to deregulation for some years to come. However, one thing is clear today: The responsibility for insuring just and reasonable prices in the wholesale electricity marketing in California and around the Nation lies with the Federal Government and particularly FERC.

As you may know, Senator Lieberman and I recently wrote to the General Accounting Office to express our concern about recent reports that market power has been abused in California. It is alleged that this, in turn, has contributed to the spiraling cost of electricity in the State. We have asked the GAO to use its oversight authority to review whether FERC is up to the task of ensuring just and reasonable rates.

The recent debate has centered on whether FERC should take measures to help ease the pain during the transition to a competitive market, and I hope that today's discussion will continue to shed light on that question.

I believe that part of the long-term solution to California's problems lies in additional infrastructure—more generation and additional transmission capacity. Some have argued that any transitional efforts by FERC would disrupt much needed investment. I must tell you that I am not entirely convinced by that argument. Pennsylvania is often held up as an example of how to manage the transition to a competitive market correctly. I find it interesting

that there are price caps on both the wholesale and retail markets in Pennsylvania during the transition.

I understand the need to protect incentives for investment. However, I must question how much incentive is required. It seems to me that the profits of the energy companies are more than adequate incentives to be a part of this industry. For example, last year the operating income of Enron, a Houston-based energy company, rose 140 percent from the previous year, from \$802 million in 1999 to \$1.953 billion in 2000. By comparison, Anheuser-Busch is a Missouri-based Corporation with a reputation for being a very well managed company. Last year, they experienced outstanding sales and growth. Their operating income grew by 8.4 percent, compared to Enron's growth of 140 percent. Last year, the S&P 500 declined by 9.1 percent. Anheuser-Busch outperformed the index with a return of 30.5 percent, but Enron surpassed the S&P 500 with a whopping 89 percent return. This level of return indicates that the incentives to invest in the energy sector are firmly in place.

I believe we can reasonably conclude that this will result in additional supply. Once this additional supply is in place, I would hope the market would level out. So my concern is how we protect the interest of the consumers during the intervening period. As we make the transition to a truly competitive market, who will ensure that prices are just and reasonable? Thus far, FERC's response has been timid. In my view, this will not do. I hope that today's questions and answers will provide insight into how the Federal Government can play a constructive role in relieving this temporary but extraordinary crisis.

Mr. Chairman, I am having to leave in just a moment, but I would like to ask Mr. Borenstein one question before I do.

As you know, many States are examining the deregulation proposals now. These States may continue to believe that competitive electricity markets can provide long-term benefits to consumers. However, they are concerned about what is happening in California. You have researched the situation in California extensively, and based on your research of what is happening there, what lessons can States like Missouri—that have not yet moved to deregulation—what can we learn? What guideposts should States use as they design a deregulation process?

Mr. BORENSTEIN. Well, there are a number of things that I think we can learn from the California experience. And they almost all fall under the general notion of making sure that there is the infrastructure support for having a competitive market. If you are going to move to a competitive market, you have to make sure that the supply side of the market will be competitive. To do that you have to have analytical tools that will let you look into the structure of the market and what sort of prices it will yield. In fact, these tools were around in 1995, and many of us were suggesting FERC use them, and FERC ignored them, and went ahead using a completely antiquated approach of simply looking at the market share of each player. But if you use the right tools, you can see how much divestiture into separate companies would be necessary to get a competitive market. At the same time, you have to have price responsiveness. You have to be willing to let people see the prices, and as I said to Senator Thompson, you have to be willing to let the people

see the prices in a way that reflects in real time what is going on so they have an opportunity to respond to those prices.

Then of course you have to have the infrastructure to actually carry the power around. One of the mistakes that California made, which has not really come to the fore yet, but will in the next few years, is that we deregulated without having a real vision of how to invest in transmission capacity in a deregulated market, and transmission investment, as a result, has virtually come to a halt. So we really do need to have a system that will beef up transmission and will then price power appropriately at each location in the system. If you do that, if you make sure you have a competitive supply in the market, if you make sure you have a demand that can respond to prices, I think you can go forward with electricity restructuring that can really work. At the same time, you do want some fall-back position, and the way you get that is as you enter restructuring, you have long-term contracts in place or ownership by the regulated utilities, that are effectively a hedge. One of things I pointed out in Pennsylvania is Pennsylvania has had huge price spikes. It is just that Pennsylvania buys very little power on the spot market because they have effectively hedged, because the utilities continue to own almost all of their capacity.

But I think if you follow that recipe, it is still a recipe for success and eventually for benefits to consumers in electricity markets.

Senator CARNAHAN. Thank you very much.

Chairman LIEBERMAN. Thanks so much, Senator Carnahan. I just want to indicate that I appreciate that you were one of the first to draw this subject to my attention anyway. I know our staffs have met with GAO, and we hope for some kind of interim report in the next three or 4 weeks to our request. Thank you. Senator Collins.

OPENING STATEMENT OF SENATOR COLLINS

Senator COLLINS. Thank you very much Mr. Chairman. I have really enjoyed this hearing today and the chance to hear such a distinguished panel of economists present their divergent views on this issue. I think that the competition that we have seen among ideas here is as important as the competition that we hope to see among electricity generators.

I do want to take advantage of this opportunity, as the Chairman has suggested, to share with the Committee some of my thoughts on this issue. Many of our States, including my home State of Maine, are striving to promote more competition in electricity markets. Maine was one of those States that pioneered this and plunged very early into the brave new world of deregulation. Competition in properly functioning markets, should, over the long term, result in cheaper prices, better service, and more innovative products for our consumers. Since price caps limit competition, they should be avoided in properly functioning markets. Unfortunately, however, electricity markets do not always function properly, and, as we have seen, California is a clear example. California's electricity markets are not functioning correctly because they were not set up correctly. When you do not allow retail prices to rise in the face of electricity shortages, you are setting up a flawed system. It is clear to me, based on the testimony we have heard today, that

California needs to restructure its market to remove artificial barriers that inhibit the marketplace. Even in an electricity market without the kinds of major design flaws that we have seen in California, however, there are still some factors inherent in the nature of electricity that can cause the market to function improperly. Because electricity is generated and consumed simultaneously, and cannot be meaningfully stored or inventoried, there are essentially 8,760 hourly electricity markets each year. Even if the markets work most of the time, there may be hours when, because of an imbalance between supply and demand, they are not workably competitive. This can lead to incredibly high prices. Since it is impossible for most consumers to respond to high hourly prices, the sellers of electricity can raise their prices an unlimited amount for short periods.

I want to give you an example that affected my State last year. During a few hours last May in Maine and the rest of New England, the price of electricity in the spot market went to \$6,000 per megawatt hour. That is more than 100 times its usual level, and, as Dr. Kahn and others have pointed out today, very few customers saw this price spike in a timely way. They could not adjust their demand. They could not respond by turning off their air conditioners for a few hours, or waiting until later to do their laundry. So in this instance, in my judgment, the market simply did not work. Subsequent to this price spike, FERC imposed a price cap of \$1,000 per megawatt hour in New England during periods of significant supply shortages. Given its limited applicability and the extremely high level, this cap seems to me to be a reasonable response. Furthermore, there is no evidence at all that it is deterring new plant construction in our region.

I want to emphasize that ultimately our goal by speaking is to alert the consumers, not just in California, but in the Nation as a whole. In Maine, homeowners and businesses alike are burdened by some of the highest electricity rates in the country. In fact, one of the reasons that Maine jumped into deregulation early was the hope and the elusive promise that it would lead to a lowering of electricity rates since we have always been at a competitive disadvantage compared to other regions in that area. Households are seeing their electricity and other energy costs eat up more and more of their incomes, and many businesses, particularly manufacturers, are seeing smaller and smaller profit margins as more money goes to purchase energy. Some businesses in Maine are even threatening to move to other regions where electricity prices are lower. I hope that we can succeed today in helping to identify solutions for California, but I also hope that our goal is to identify ways to lower electricity prices in the rest of the Nation. We need to look closely, and we have looked closely, at the lessons that we can learn from California, and we also need to be careful that we do not blindly apply California-size solutions to New England, which has been by and large very successful in avoiding California-size problems. In fact, we have had a number of new generating plants come online, and yet we are still experiencing these distortions in the market.

In the final analysis if we are firmly committed to competition, as I believe that we should be, we cannot seek government inter-

vention whenever the prices are high. But on the other hand, we must recognize that electricity markets have unique characteristics which may cause them to not work competitively at times. Thus, in dealing with electricity issues, I think we need to combine competition with common sense. Finding the right mix, that which will lower electricity prices for all Americans, is no easy task, but this hearing provides a basis for us to try to strike the right balance.

I do want to ask Dr. Kahn a question, since I agreed with so much of what you said in your statement.

Mr. KAHN. That is funny, Senator. I was going to say I wish I had written what you just said.

Senator COLLINS. The approach you have suggested makes much sense to me, as does the idea for short term carefully constructed price caps. My one concern is that we have seen price caps that were intended to be temporary, become permanent. We have seen these results. And I like what you have suggested about having them designed to be temporary, to automatically sunset them and to make them inapplicable to new capacity coming online. But, can you give us some more guidance on what you think should trigger the expiration of the price caps in the kind of scheme that you have described?

Mr. KAHN. There are only two ways that occur to me, both of which I have mentioned. I like the idea of automatic sun setting; that is to say, one makes a reasonable estimate of what it takes for new capacity to come online and then requires a reenactment, rather than requires an explicit repeal. So that was the one that I suggested. We have been through a period 30 or 40 years ago where we tried to differentiate caps on old and new sources of supply in the case of natural gas. And I think we would have to say that was not a success, to put it mildly. Whether that is feasible in these circumstances, I truly do not know. Certainly, it is not a good long-term expedient. Power is power is power, and it is absurd to have discrimination in charges to different people. But some way of making absolute the guarantee that new investment will not be subject to any kind of—even if it is an arbitrary cap.

The only other observation follows partly from what I have said. In electric power we have not had a problem of shortage under regulation. On the contrary, regulation, by assuring an adequate return on investment, has tended if anything, to encourage gold plating of service, and having excess capacity.

Senator COLLINS. Which is why everyone thought it was going to be this boon to consumers.

Mr. KAHN. That is why we thought we had such enormous excess capacity, including by the way, the inflated prices that the electric distribution companies were forced to pay to independent generators. I think Dr. Makovich mentioned the ridiculous prices under the Public Utility Regulatory Practices Act. It has all been in the direction of encouraging excess capacity. That is why I kind of bristle when people say yes, but price controls always restrict supply. You have to look at the particular situation. That is not true historically. But other than that, I am really repeating what I said, different ways of ensuring automatically that new capacity coming online will not be subject to these.

Senator COLLINS. Thank you. Dr. Joskow, do you have anything to add to that?

Mr. JOSKOW. Yes, Senator Collins, very briefly. By the way, I would love to subscribe to your statement as well.

Let me talk about New England just to move across the country. I remember those \$6,000 megawatt hours very well, and I think I paid for them in August. In New England I think we can establish a relatively small set of criteria for when the market is sufficiently reformed to remove price controls, except perhaps for these kinds of damage control price caps at very high levels, so that the price does not go to \$1 million a megawatt hour. So in New England right now we are in the process of a major market redesign. There are specific items that have to be completed. When they are completed, we should be in much better shape in terms of operating the spot market and dealing with congestion management. We have a number of power plants in Maine, New Hampshire, Massachusetts and Rhode Island that are in the process of being completed. The New England ISO has a target minimum reserve margin. We are going to reach that I hope next summer. That is another criterion. Third, I think contract cover is important, that retail customers and the entities that serve them, have substantial contract cover. We are pretty good at that in New England right now, and I think we need to stay at around 70 percent. Finally, I would like to see us get about 10 percent of the load in New England on real-time prices, really, some of their demand, so they in fact, can see and respond to the \$6,000 a megawatt hour prices if they emerge again. I see those structural fixes being in place over the next 18 months, and I am hopeful that the markets in New England will really be working well then, and that we can take off any of the heavy-handed regulation and rely on continuing very, very light-handed regulation to ensure that the markets work competitively.

Let me note that since last summer I have had more calls from State officials in New England than I think I have the rest of my life. Five of the six States in New England have restructured radically. They did many of the same things California did, and the people there are scared. We cannot do what they can do in Missouri, which has not moved forward, and I have been very, very pleased to see the kinds of cooperation that the market participants, the ISO, the kind of cooperation they have gotten from the public utility commissions in the region, from the Governors of the States, from the attorney generals. I really see people working together in New England in a very, very constructive way, and I must contrast that with the atmosphere in California. Maybe we are just more civilized in New England. I do not know, but—

Senator COLLINS. I have always thought so.

Chairman LIEBERMAN. We show a bipartisan agreement on that.

Senator COLLINS. That is right.

Mr. KAHN. I think it shows we can do a lot better if we work together, rather than just screaming at each other. Thank you.

Senator COLLINS. Thank you. Thank you very much. I really enjoyed your testimony. It was very interesting.

Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, Senator Collins, and thanks for asking some questions about New England. Senator Voinovich.

OPENING STATEMENT OF SENATOR VOINOVICH

Senator VOINOVICH. I, too, have enjoyed the testimony this morning. It may come as a surprise to you that Ohio is the third-largest energy dependent State in the Nation behind California and New York, and back in March 1999, in my first State of the State address as Governor of our State, I called for a comprehensive energy strategy to keep the lid on energy and utility costs for our citizens, and to try and stay competitive with other States that I was concerned would be taking some of our businesses away because of the lower cost of energy, particularly the State of Pennsylvania, which was one of the first States to restructure. As a result of that effort, we proposed and published the energy strategy report. That was back in 1994, and we started to discuss the whole issue of restructuring and did not pass the legislation until 1999, but a lot of the heavy lifting in anticipation of it was done during the 3 years prior to my leaving the governorship.

One of the major provisions in the restructuring effort was that rates were capped during the first 5 years of energy restructuring to protect our consumers, but we were careful in terms of the rate because we had to recover stranded costs, and we tried to get a reasonable return for our utilities, and it has worked out, and we have had new energy producers come online, several thousand megawatts, and have another 13,000 or 14,000 in the pipeline. The thing that bothers me about the new facilities coming on is that they are all powered by natural gas, and because of some environmental concerns, a new source review and lawsuits that were filed by some folks in the northeast, they have turned away from the use of clean coal technology for our coal, and of course we are all aware of the fact that we could be doing a much better job in terms of taking advantage of nuclear energy in this country.

But the fact is that we have a crisis in California, and everybody's wringing their hands, and I think California did it the wrong way. They separated the major functions of the generation transmission and distribution system. Three of California's major utilities were required to divest large portions of their generating capacity. They precluded major utilities from entering into long-term contracts for electricity supply and required that they sell their remaining capacity on the spot market. I do not think they did it right, and now the chickens have come home to roost, and they have a problem.

The question I have for this panel is this: Does Congress need to get into this and start passing legislation to deal with this problem, or should we let this problem be worked out through the traditional ways? Now FERC is involved. They got in a little bit late, but they are involved in the process. Do we need Federal legislation to deal with this, or should we leave it to the system that we have in place? You were talking, Dr. Joskow, about the governors and the utility commissions getting together and working together. FERC is now involved. What is your opinion about that? Should the U.S. Congress get involved?

Mr. JOSKOW. Senator, I think that is a very good question. Ideally, I think no. I think FERC should enforce the law, and if I could recommend anything, it would be perhaps a letter from the U.S. Congress to remind FERC the Federal Power Act has not been repealed, Congress has not just deregulated wholesale power markets, that their job is to ensure that they work well and to continue to oversight, of FERC, to get them to do their jobs. I think in the longer run there are some questions in my mind as to whether FERC is currently structured, both in terms of personnel and its conception of its missions and its procedures, to oversee the development of well-functioning competitive electricity markets. I would like to see FERC evolve more into an agency that is involved in monitoring, identification of market failures, and mitigation. It is structured as an agency that for almost 50 years basically did rate cases when investor-owned utilities sold power to municipal utilities. I think the agency needs to change. It has got to be more like the SEC in monitoring these markets, and I think that would be a very productive thing for Congress to look at and to explore whether amendments to the Federal Power Act are necessary to make that happen. FERC's responsibilities are now very different from what they were only 5 years ago in terms of the quantities of electricity, the amounts of money and the nature of the industry. I think it does make sense to revisit whether that agency is properly structured and whether its objectives are properly focused on the new world rather than the old world.

Senator VOINOVICH. Thanks. Dr. Hogan.

Mr. HOGAN. Senator, I think this is a very good question. Legislation by the U.S. Congress at this point would be premature, and I think it is because the problems that you are dealing with here are so complex, that trying to prescribe the solutions that are going to be applicable for California and the rest of the country, cannot be done through legislation. We have an example of that going on in the discussion here today. When Fred Kahn introduced into economist lexicon the term "banana", because of the difficulty of getting the ideas across, he was talking about, as I recall, a situation where he wanted the same idea but a different name, because he wanted to be able to talk about it politically. I think what is going on here is we are talking about different ideas and putting them all under the same name, and people are very confused as I have heard it in the discussion today. For example, Senator Lieberman said that five of us were in favor of price mitigation. But I think, at least for part of the discussion, when I heard Paul Joskow talking, he was talking about market failure mitigation, and that is a helpful contribution to this discussion. I am in favor of market failure mitigation, and I described a mechanism, the bid cap scheme, that FERC has been pursuing that is directed at that problem. It may lower prices. It may not lower prices. It is not targeted at price mitigation. That is not the objective, and I do not think it should be the objective. I think correcting the market failures as quickly as possible should be the objective and that is something that is not a good thing for the Congress to try to do. That is something you need FERC to do. And then when you look at FERC—I agree with Paul Joskow's observation. I do not have any question in my mind about it. I do not think that the commis-

sion is able to deal with these problems at the moment, and I think they have been going in the wrong direction.

FERC's responsibilities have changed in reality, if not in their perception, and their responsibility has to be to design, and make sure that people adopt the rules for effective markets, the kinds of market infrastructure that Severin Borenstein has been talking about. They have been very slow to do that, partly because they feel confused by these very complicated problems. And if they are confused by these complicated problems, imagine what it would be like trying to write legislation. So the real challenge is to beef up the FERC staff and change their mindset.

Senator VOINOVICH. One of the issues that this Committee has been dealing with, and I have been addressing in the Subcommittee on Oversight of Government Management and Restructuring, is the human capital crisis that we have in the Federal Government. I would be interested in your observations. If it is like some of the other agencies, such as the Nuclear Regulatory Commission, for example, the number and quality of people really needs to be punched up if we expect it to do the job that it is supposed to be doing.

Mr. HOGAN. They have some very good people at FERC, but they do not have enough, and they need more, particularly people trained in markets and able to deal with market design issues. They increased the size of that staff to reorient the agency and to make the Commission take it on that it has a new job—market design.

Mr. JOSKOW. And let me give you a couple of good examples. The Federal Trade Commission has a large economic staff that is fully integrated with the lawyers and others in enforcement and investigations. It is considered to be a prestigious place to spend a couple of years if you are an economist. The Antitrust Division of the Justice Department is a similar type of arrangement. FERC has lost some very good people in economics and markets, and they never really had enough. I really think that we should look at other agencies that have been successful, like the Federal Trade Commission and the Antitrust Division, to see if we can bring the best skilled people to bear with the appropriate focus. I do think there are compensation issues that have to be addressed. It is one thing for me to come and spend a couple of years, take a leave from MIT and spend a couple of years. It is another thing for a civil servant to spend his or her whole life in the agency. We need to recognize and compensate these people, as well as to make it a rewarding professional experience for them.

Senator VOINOVICH. Dr. Wolak.

Mr. WOLAK. I guess on your first question, what I would say is, I think that the same fundamental problem is going to arise again and again in competitive electricity markets until the following issue is addressed, is that competitive markets do not, by their very nature—or markets, rather, by their very nature, do not yield just and reasonable prices. And having in the Federal Power Act, a standard that rates wholesale electricity prices must be just and reasonable, is really in some sense incompatible with a market, because it creates, I think as Senator Thompson said, “this sort of incentive of OK we will do what we do, but if things go really bad

because of the just and reasonable rate standard, we will get bailed by the Federal Government.” So if I was going to say the one thing that would be necessary is to essentially either get rid of it, of that standard in the Federal Power Act, and say, look, in a market, prices will be what prices will be, so you need to take the precautions necessary in advance to make sure that those sorts of eventualities do not occur, and then I think the market will work. But if you create the sort of circumstance where there is this just and reasonable rate standard, then you always have this problem that I always have the recourse, and in some sense, that is to me the fundamental incompatibility between a competitive market and this just and reasonable rate standard.

Senator VOINOVICH. Any other comments?

Mr. BORENSTEIN. I had one comment. I know personally of a couple of economists who have gone to the FERC, and compensation is an issue, but I think the much bigger issue is the mindset. The economists and the policy analysts at the FERC have not really had enough influence on decisionmaking. I was a staff economist at the Civil Aeronautics Board during airline deregulation. I was lucky enough to work under Professor Kahn, and I was lucky enough to work at a time when we were going through deregulation and we were spending many days sitting around, saying, “Well, if I were an airline and these were the rules, what would I do trying to make as much money as I can?” And just walk through that analysis. Had the FERC had people who were doing that and were being listened to in 1996, we would not be here today because there were many people telling the FERC, “If I were a generator and you set up these rules, here is what I am going to do.” Unfortunately, FERC did not have that mindset. FERC had the mindset of, “We have a legal process we go through. People file documents. We read them, etc.” FERC really needs to get the staff, and to listen to the staff, who are going to do that sort of policy analysis. And if they do that, I think they can be quite successful.

Senator VOINOVICH. Thank you.

Chairman LIEBERMAN. Dr. Makovich.

Mr. MAKOVICH. My final comment on that. I think what you see here is a general consensus that the California market was set up flawed. Because it was so complicated and difficult to do, it was not done well. What we have also, I think, agreed on here, is it has not been fixed, and price caps are a Band-Aid, not a solution to the problems there. So the role of the Federal Government, either through FERC or legislation, is to provide leadership here on how power markets have to be set up right, and there are a minimum set of structural requirements that we have to have in all power markets to avoid the market failures that we have been talking about.

Chairman LIEBERMAN. Thanks, Senator Voinovich. That was a very interesting series of questions, and they really go right to the heart of the Committee’s oversight role, because what we are really overseeing here is not the California or Western energy crisis that happens to engage us, but it is what is FERC doing about it? And I appreciate the comments you made about the role of staff within the agency, and there is no question—may be one of the unex-

pected results of this crisis is that bright, young economists will think about going to work at FERC.

Mr. BORENSTEIN. Well, bright, young economists did in the last few years, and they were there for a year, and they left.

Chairman LIEBERMAN. That has to change then.

Senator THOMPSON. Speaking of the jurisdiction of the Committee, I am reminded of the fact that it is very relevant to another subject we spend a lot of time on, and that is federalism. Here you have the classic question of what should government do and at what level should it do it? We have got a State responsibility and a Federal responsibility, and they overlap somewhat. Each is trying to cast responsibility on the other side, and each wants perhaps the best of all worlds. It is a fascinating federalism issue.

Chairman LIEBERMAN. True.

Mr. KAHN. A very brief answer, if I may, to Senator Voinovich is, that this is an oversight committee, and I have had 6 years of experience in two places with oversight committees, and legislation, I do not think you could get any agreement right now what the legislation would be. But inducing the kind of discussion and thinking that is going on, or should be going on here, I think that is where you all play a very essential role. Everybody seems to agree with that.

Chairman LIEBERMAN. That is certainly my hope here. I would rather that we not have to go forward with the legislation, that FERC provides a response that is adequate to the occasion, whatever that might be. So thank you. Senator Carper.

OPENING STATEMENT OF SENATOR CARPER

Senator CARPER. Mr. Chairman, I apologize to our panel and to my colleagues. I have been presiding over in the Senate during the debate on education, and I have missed, with the exception of Dr. Kahn's comments, I have missed all of your comments, and I will not ask you to repeat yourself, but I will ask you to do one favor for me, and sort of provide us with a benediction. I like to say sometimes when I am speaking to a group, I try to tell them what I am going to tell them, I tell them, and then when I finish, I tell them what I told them. And we are at that point where I am going to ask you to tell us what you told us.

What I want to do is this. I am going to ask each of you to take maybe a minute, tell me where you agree. Tell me, throughout this panel, where you agree and what is the appropriate role for us in the Federal Government, in the Senate, where is the consensus? And I will just start with you, Dr. Borenstein.

Mr. BORENSTEIN. You want to specifically focus on what the appropriate role of this Committee is?

Senator CARPER. The Federal Government, where is your consensus? No, where is your consensus of the role of the Federal Government?

Mr. BORENSTEIN. I think the consensus is that California is in the midst of a crisis this summer, that a lot of it needs to be done at the Federal level. I think there is near consensus that the FERC can do something to help mitigate prices for this summer, and I think there is widespread consensus that that should not be a long-run tool that the FERC should be using.

Senator CARPER. Is part of that consensus that the FERC has every authorization that they need to proceed without our legislating?

Mr. BORENSTEIN. I am not an expert in that area, but it is certainly my impression that the FERC, if they wanted to step up to the plate, would have all the powers they needed to.

Senator CARPER. Thank you very much. Dr. Hogan.

Mr. HOGAN. I think there is also a consensus that there are a number of things that have to be done in California that have not been done or done fast enough to raise prices to retail customers, put in metering, get the demand side included in this marketplace, and that is an urgent matter. It has been for a long time, and it continues to be. This is something FERC has relatively little control over, but it is something that California has a lot of control over. And then fixing the market design, which has been a problem since day one of operation of this market, not just this last year, should be completed, and that is a problem not just in California. It is a problem in the west. It is a problem in the midwest, the southwest, the southeast. About the only place that has, I think, a workable market design is the northeast.

Senator CARPER. Good. Thank you, sir.

Chairman LIEBERMAN. Here here.

Senator CARPER. When I was leaving, Dr. Kahn was saying that there was somebody on the panel who was his former student. Is that you?

Mr. JOSKOW. It was me.

Senator CARPER. I noticed when he spoke, your lips moved. [Laughter.]

Chairman LIEBERMAN. In the interim, Tom, Dr. Joskow indicated that Dr. Borenstein in turn was his student.

Senator CARPER. And Dr. Borenstein then told us that he worked for Dr. Kahn at the CAB, so it is a little bit—pretty incestuous, is it not?

Mr. JOSKOW. Senator, I think there is actually a lot of agreement on this panel. We all agree that the markets in California and the west are broken. There is a lot of blame to go around. We agree that there are both long-term problems and short-term problems. We agree that FERC has the authority and needs to do a better job in fixing both short-run and long-run problems. I think a majority of us agree that mitigation options exist for this summer that are important both to protect California consumers as well as to convince other States that are on the path to restructuring competition, that Federal officials will not abandon them if they have problems. We agree that these mitigation methods have to be designed sensibly, that they can be designed in a way that does not deter investment in new generating capacity, and I think on all of those things, I think most of us agree. We have some differences as to exactly what is wrong, exactly how much of the price increase is due to market failures, market power, and how much is due to higher gas prices and higher demand, and higher NOX credit prices and so on.

But I think what you are hearing from this panel is that FERC needs to step up to the plate, they need to become informed, they need to do something. And I would add my personal view, just look-

ing at this over the—I do not know if there is agreement—over the past year, there has been too much screaming and too much paper flying back by Federal Express written by lawyers, back and forth between Washington and Sacramento. And I really would like to see the technical people at FERC be able to get together with the technical people at the ISO, with some of the economists in California, have a series of technical conferences and work out some fixes for this summer. I think this is not as hard as everybody has made it. We need to have a more cooperative spirit here, and as I said when you were out, there is plenty of blame to go around, and let us all accept the blame and let us move forward. I just think we can do much better.

Senator CARPER. Well, as one who was trained as an economist, not as a lawyer, I do not take any umbrage to which you just said here. Dr. Kahn.

Mr. KAHN. I really do not have much to add to what the people on my right have said. I do not think that legislation is necessary. You have got the provisions of the Federal Power Act now. It seems to me that the oversight function of getting FERC here and saying, “OK, there are your responsibilities, what are you doing about it?”, is terribly important. You are never going to get complete agreement about in what respect these designs were perfect or imperfect, so there is a very wide range of agreement. I am curious that no one has raised the question about whether it was wise totally to require the generating companies to divest their—I mean the distribution companies to divest their generation.

Mr. BORENSTEIN. I think there is agreement it was not wise.

Mr. KAHN. Obviously, it was not undertaken lightly. No one has raised it. Obviously, if you still owned all the generation and you were still regulated at the distribution level, the situation would be very different.

The one area in which we may not have come sufficiently close to agreement, but we have never really encountered, is that there have been studies by people like Dr. Borenstein and Professor Joskow, which purport to find definitively that there has clearly been evidence of withholding, of exercising market power, and I have not seen anybody directly challenge that except *The Wall Street Journal*, which published an editorial saying he left out five other causes—the price of natural gas, the cost of NOX emissions—well, read his letter in *The Wall Street Journal* today. As Paul says, I looked at every one of those things. I mean, *The Wall Street Journal* is still trying to get President Clinton impeached. It paid no attention to the fact that he had done all these things, and so I have been acting in part on the belief, and I think Frank Wolak has done the same thing, that there have been people who have found that there has been a market power problem here. Well, mitigation of that is surely something you have the right to demand of an agency that operates under your jurisdiction.

Senator CARPER. Mr. Chairman, thank you. I really want to thank you for being here today and for your good work over the last several decades, as well as training a whole new generation of economists. Please.

Chairman LIEBERMAN. Senator Voinovich, did you have something you wanted to say?

Senator VOINOVICH. I was just going to comment that I think that Dr. Kahn, as one who has observed this whole area for many many years, has two students, or one student and one indirect student here, has made a great suggestion, and probably the most positive thing that you could do as Chairman of this Committee is to bring FERC in here and have a hearing and have them respond about what they are going to do about it.

Chairman LIEBERMAN. And in fact, they are coming in next Wednesday on the 20th.

Senator VOINOVICH. Good.

Chairman LIEBERMAN. That is exactly what we would want to do. And I do want to repeat, I hope that FERC will act in a way that the move to have legislation adopted here ends, because it is not the best way to do it, particularly in the short-term case here where everybody is saying what is needed is temporary relief. Those who are saying that any relief is needed, say it is temporary relief, so I look forward to having them in—all five commissioners will be here next Wednesday.

Senator CARPER. Two more witness, please, if you would just conclude. Go ahead. Thank you.

Mr. MAKOVICH. I think there is a consensus here that power markets are very complicated, and as a result, we have got multiple flaws as we look to the California example in particular, which means that there is no simple solution including price caps, that it is difficult to fix in the short run, and that there are however, examples of people that have done things far better than California, like New England, and Pennsylvania, New Jersey, Maryland, the way they set up their markets.

Senator CARPER. PJM?

Mr. MAKOVICH. Yes, PJM.

Senator CARPER. Glad you mentioned that. Thank you.

Mr. MAKOVICH. This can be done right. Just to differ on—there is not a consensus here that market power is the problem. It harkens back to, for example, when we had the blackout in 1965, 9 months later *The New York Times* ran an article about the record births at Mt. Sinai Hospital, and there were experts that had testified or had reported to *The New York Times* that there was reasons to expect that the blackouts had lead to people become amorous. And it was 5 years later—

Senator CARPER. I am anxious to see where you are going to take this.

Chairman LIEBERMAN. I may have to exercise the gavel on my first day as Chairman.

Mr. MAKOVICH. It was 5 years later in August 1970, that there was a study done by the School of Public Health at the University of North Carolina that went through all the data and debunked the notion that there was a boomlet of births after the blackout.

Mr. KAHN. How disappointing.

Mr. MAKOVICH. Some of this outage data, we have to be careful, that we may be misinterpreting it right now. It is complicated.

Senator CARPER. Thank you, sir.

Chairman LIEBERMAN. This might have led to an appeal for more blackouts, and we would not want to have that adverse market effect.

Mr. WOLAK. The advantages of being last is you do not have much to say, but the only thing I would say is, to follow-up on what Paul Joskow said, as the chairman of the Market Surveillance Committee, which was, believe it or not, established by FERC to be, if you like, the eyes and ears in the California market, it was shocking to me that in sort of—when the crisis sort of first started, there was absolutely no communication with the Committee, despite the fact that we had prepared over the intervening 2 years, numerous reports, had analyzed the bid data, the production data, etc., so I really think that, exactly, rather than the lawyers talking it out, a very good thing would be a discussion among the staff at FERC, as well as the market monitoring committee, as well as the department of market analysis at the ISO, to essentially work to formulate a solution that will help to make things work, and I think there are a lot of very good and capable people at the ISO that I think could very much help FERC do its job very well.

Senator CARPER. My thanks to each of you. I again apologize for missing much of your testimony.

Mr. Chairman, thank you for indulging me and I am delighted to hear, in response to what Senator Voinovich said, that we have got all five commissioners coming in next week, and we will look forward to that. Sounds like a great idea.

Chairman LIEBERMAN. Thanks, Senator Carper. That was very helpful to do that.

I think Senator Thompson and I at least, and maybe Senator Voinovich, want to ask a few more questions. So that was a great summary of what has happened.

I appreciate the focus on FERC, and it is interesting that as this discussion was going on today. It was noticeably different, and one of the reasons I think is that we have been thinking at least here in very legalistic terms, because after all, FERC operates under a law and we have been talking about just and reasonable rates and what powers they have and should have to exercise them. I think there has been a lot of common sense here at the table.

I am curious about whether so much experience and good thinking around the table—are any of you ever consulted by FERC in what they do?

Dr. BORENSTEIN. When FERC did their investigation last summer, I am on the governing board of the California Power Exchange and director of the UC Energy Institute, and I called Scott Miller, who was the person—I guess one of the people running that, and never was called back.

Chairman LIEBERMAN. Dr. Joskow.

Mr. JOSKOW. When the California markets were being set up, FERC, at that time in 1996 and early 1997, had a series of technical conferences, and they invited me to speak. Indeed, one of them involved setting up a market surveillance committee at the ISO, and what data they should collect. And so one of the great mysteries to me in all of this, is why they set up these entities which were supposed to be independent, and then for 2 years, ignored them. I thought that was a brilliant idea, to sort of decentralize the monitoring, that Frank Wolak, Carl Shapiro, who has been the chief economist in the antitrust division is now at Berkeley. Al Klevorick was on the PX, and I think it is a worthwhile

question to ask FERC. You set up these market monitoring entities. They have got great people on them, they do good studies. Why do you not build on that and work with them? And I have asked them that, and I do not understand the answer.

Chairman LIEBERMAN. We will ask. Let me ask another question. I think I will ask Dr. Wolak this one, and invite anyone else who wants to respond. There has been some concern, as you know, that even though FERC determined last November that the prices in the California market were not just and reasonable, that they have done not enough regarding examining past overcharges and providing refunds to wholesale customers, which might make up for some of the high costs. Do you have a reaction to that?

Mr. WOLAK. I very much agree with that.

Chairman LIEBERMAN. Excuse me. Dr. Kahn, you have to depart, am I right?

Mr. KAHN. In a few minutes.

Chairman LIEBERMAN. Thanks very much for being here. You contributed—

Mr. KAHN. I apologize.

Chairman LIEBERMAN. No, not at all.

Mr. KAHN. The people who deregulated those dammed airlines. [Laughter.]

Chairman LIEBERMAN. Thanks very much for coming.

Mr. KAHN. I am awfully sorry.

Chairman LIEBERMAN. Not at all. We are going to wind up soon. You were a great help.

Mr. KAHN. Thank you so much.

Chairman LIEBERMAN. Dr. Wolak.

Mr. WOLAK. I guess as I said, I definitely agree with the viewpoint. In fact, I would go even further to say that effectively FERC said that if there is market power, then we will essentially order refunds of any rates that reflect the exercise of market power. Unfortunately, effectively in my entire 2 years, almost 3 years on the Market Surveillance Committee, FERC has never determined what constitutes the exercise of market power, in other words, what prices would reflect the exercise of market power? What behavior on the part of the generator would result in prices that reflect the exercise of market power? So in many ways it is sort of looking for something that you do not know what it is. So what we have had to do, as well as Professor Joskow has had to do, is essentially say, well, we will use the standard definitions from economics to determine what are the payments in excess of competitive prices and what reflects the exercise of market power. But as far as FERC is concerned, even despite numerous meetings with FERC staff and conferences with FERC commissioners, a definition for what constituted market power and what constituted prices that reflect the exercise of market power, that definition was never given. So in some sense, it makes it very simple never to have to confront that issue.

Chairman LIEBERMAN. Anyone else want to speak to the question of refunds? Dr. Makovich.

Mr. MAKOVICH. The question of just and reasonable prices is a difficult one for many reasons, but right now, the prices in California with the shortage are too high, and that is why the finding

of just and reasonableness by FERC was that these are too high. But we have to remember, when the California Power Exchange opened, on its first day, there were hours when the price of power cleared at zero. And it continued. That is something that we have seen through time, that the price will clear at zero. Is zero an unreasonable or unfair price to a producer? And the point that has been made here, is if there is a 4-year lead time on building power plants, the prices are too high right now but this is not the right time to give somebody a signal to build. It was 4 years ago that we had to give people the expectation that if they build a power plant, they could make money. And if the explanation was, sure, prices clear at zero. They are averaging \$14, but in the year 2000 and 2001, there will be an extreme shortage, and you will be able to make all your capital costs back within just 2 years, although you will be vilified as the cause of the problem, I do not think you would have got a lot of investment. So there is fundamentally still a problem here on investment incentives and just and reasonable prices. Capping them now neglects the fact that they are too high now because they were too low previously.

Mr. WOLAK. May I just respond to that? I think it is very important to bear in mind that the zero prices he is referring to were not really paid to anyone.

They may have been paid to small, small, small amount of capacity sold, but primarily most of the times when those prices of zero occurred, these were in a capacity that is called "must take" and is being paid under a different contractual arrangement as primarily setting the price.

So the other, I think, I want to also correct a few more misunderstandings here is the statement that these prices were too low. The average price for 1998 was not \$18, it was above \$30. And, moreover, generators in California also have the opportunity to earn ancillary service payments, which are payments to provide reserve capacity that roughly average on the order of about 7 to 10 percent more revenues to their facilities. Moreover, generators in California also have the opportunity to sign up for reliability must-run contracts, which pay them large amounts of money in payments to provide local reliability service, in addition to the prices that they receive for energy.

So, I think we want to be very clear on all of the sources of revenue for generators in California.

Chairman LIEBERMAN. We seem to be replicating the "Cross Fire" show on television.

Mr. MAKOVICH. Just a quick one—

Chairman LIEBERMAN. Just a quick one because I want to ask one final question, though it is a good exchange.

Thank you.

Mr. MAKOVICH. The \$30 level is an average on-peak price.

Mr. WOLAK. No, it is not.

Mr. MAKOVICH. Well, even if it is across all hours—

Mr. WOLAK. Yes, it is across all hours.

Mr. MAKOVICH. You need something closer to \$50 to justify building a power plant, and not everybody gets ancillary services. It depends on location.

Mr. WOLAK. That is not true, either.

Mr. MAKOVICH. The fact that nobody built power plants in California has to make one wonder, if they built them in Texas, and they built them in New England and did not build them in California, maybe there was a problem with the investment incentive.

Chairman LIEBERMAN. Yes. Let me move on because I was really asking about refunds, and we got off a bit.

The final question is the effect of what is happening. We are all focused on California, but they are part of a regional grid, and I know seasonally power generating facilities in other States have fed into California. I was in Washington State, where, I am sure you all know, they tell me some of the aluminum plants have stopped because they are selling their electricity and making more than they could making aluminum, and people are out of work. So it is serious.

I wonder whether you think that FERC should be including the other Western States in its response to the problems in California and its regulatory response to the problems in California.

Dr. Joskow.

Mr. JOSKOW. Senator Lieberman, if I might, I think to make the mitigation program that I mentioned before, which is extending the protocol FERC put into effect on May 29 to all hours, it is essential that it apply to the rest of the region, as well. This is the only way to deal with some of the problems that Frank Wolak mentioned, involving essentially daisy-chaining the power from one reseller to another.

So I would strongly recommend that if that is the approach that FERC takes that, in addition to extending the number of hours, that it include at least the other major control areas: Arizona Public Service, Tucson; Nevada, Bonneville; Public Service in New Mexico, in this program, and that is going to be the only way to tag the power plants that are supplying the power and applying their marginal cost base mitigation plan.

Chairman LIEBERMAN. Dr. Borenstein.

Mr. BORENSTEIN. Yes, I agree with Dr. Joskow that we really do need to do this on a regional basis because there are a lot of loopholes that can easily be exploited. I think it is also important to recognize, when we get onto this investment subject, I should also say, as director of the Energy Institute, I do not do consulting for any private companies in the business. So I have no financial interest here.

It really concerns me when we start talking about the need to give firms capacity payments in order to get them into the market. Economics tells us pretty clearly that if you have competitive prices all of the time, you will get the right investment. Now it is going to be pretty disruptive in the electricity industry if you do not have a demand that can participate, and that is why you want to have long-term contracts and that is why you want to have demand responsiveness.

But we need a regionwide approach to this, and we need to recognize that the goal here is not the lowest prices in history. The goal here is competitive prices that will ultimately serve consumers, and sometimes those competitive prices will be very low, and sometimes they will be high. The goal is to make sure they are the competitive ones.

Senator JOSKOW. Could I add a note of history to this? When I was at Yale, I taught economic history. The Federal Government induced California to build long transmission lines to link them with the Northwest in the 1960's: Two AC lines, one DC line, and then in the 1980's a third AC line for the municipal utilities, and they were encouraged to rely on the Northwest for power and for the whole region to operate as an integrated system.

One of the things that has happened as a result of this crisis is that every State is trying to grab onto its power supplies, which is just the opposite of what we hope to emerge in competitive wholesale markets, and abandoning would have been one of the best examples of regional cooperation anywhere in the United States, and I really think that we do not want to go back to a system where every State think it has to be energy self-sufficient. It would be a terribly, terribly costly mistake.

Chairman LIEBERMAN. My time is up, but, Dr. Hogan, I want to give you a chance to respond.

Mr. HOGAN. On this question of extending the FERC order to around the clock and to around the region, there are a number of things you have to be very careful about in doing this. It is not so simple.

The FERC order includes a requirement that people bid in, under these bid caps that they have put in place, and it is one thing during these emergency hours. But it would be another thing during all hours. For example, there is the credit worthiness problem. They also are going to require that they be paid, and right now a lot of the problem is that people are not being paid, and that is why they do not want to produce. And if the Federal Government is going to mandate that you produce, they have to address that problem.

Second, there is the problem of dealing with facilities that have cumulative limits because of environmental restrictions or any other kind of constraints, hydro facilities and the like, where the amount that you can produce over the year is limited, even though in any particular hour it might not be. And right now the order punts on that because they did not know how to deal with that problem, but they were only dealing with it during shortage hours so it did not matter so much. But if they go around the clock, this is going to become a big problem that they are going to have to address.

Right now they have a system where they have discriminatory pricing rules for inside California and imports and power that is coming from outside California. That creates the opportunity for the marketers to get around the rules, as they perceive them, which I think is a good thing. The way to solve that problem is to simply go to a single-market clearing price. As Fred Kahn said earlier, when the imports are the marginal supply, then you should use those to set the marginal cost, not trying to set multiple prices for different markets.

If they extend to the rest of the rest, they are going to have to deal with the problem of reserves. Do you want to draw down the reserves in Idaho in order to satisfy California and create reliability problems? These are not trivial issues and they are going to have to be worked out. There are solutions to these problems.

They are going to have to get demand-side participation into the system somehow, which so far they have not been able to get in California, and that should be done across the whole West, if they can get to it.

Chairman LIEBERMAN. Thanks very much. I will think about your answer. Senator Thompson.

Senator THOMPSON. Thank you very much, Mr. Chairman.

I think it is good that we have FERC in, but least we spend all of our time concentrating on what they might could do with what I read is about 50-percent of the power that we will be dealing with, I think we need to understand that we are in the midst of a political issue. I mean, this is something public officials are going to have to decide, and I think until then, we need to take a close look at what FERC's proper role in this should be.

But until we have some acknowledgment that California will allow its consumers to pay a little closer to what their energy costs really are, instead of relying on other forces and outside forces to do that for them, I think politically you are going to have great difficulty on shifting responsibility all on FERC.

I just do not think that when you look at all of the factors that everyone acknowledged played a part: The structural situation that they set up, the insufficient capacity to meet the demand, the infrastructure problems, the weather problems—you are just not going to get most people to believe, I do not think, that all of this is because of wicked suppliers in Texas. So we need to look at a whole part of the picture. The governor will be here, and hopefully we will be able to see whether we could get the State and the Federal entities to agree that everybody needs to do a little something here and have a more likely solution.

I want to ask one question, but I want to lead into it a little bit. I want to ask about the risk of not getting this cap situation right. In the first place, Dr. Hogan, do you agree that there is near unanimity with regard to the role of market power in this problem or do you think that is questionable?

Mr. HOGAN. I do not agree with that. I have looked at the analyses of this study, and I have done some independent analysis of some of the data that we can get in the public domain. My position on it at the moment is that it, with the information that we have in the public domain, which is insufficient, it is not possible yet to make a determination; in other words, that the margin of error is larger than the size of the effect we are trying to estimate.

Senator THOMPSON. But we have, I presume, somewhat of a disagreement on the panel. At least two of you have questions with regard to the significance of market power playing into this price. Assuming that it does play a part or a large part, I want to address the difficulty in getting the caps right—the unintended consequences, the deciding of who, what, where, when, and how. I also want to address the complexity, if it is going to be a cost-based situation, of having hundreds or I guess thousands of suppliers and trying to determine what their individual costs are so you can determine what they are going to be allowed to charge. Also there is the issue of FERC only covering half the system and having two tiers, new entrants who are not covered, and old entrants who are.

You know, we are reminded of Marc Rich back in the oil cap days. That is the way he made his money, apparently, with those two tiers and playing them against each other. Obviously, it is different with electricity, but it comes to mind. The point being the investors. You say in a perfect world here is the way it could work. You put it on at the right price, not too high, not too low. Have it administered correctly. Then you take it off at the right place, knowing that there is nothing that the government does that cannot be undone, causing credibility with regard to potential investors.

My point being that it seems to me, and I think maybe several of you have acknowledged on both sides of this issue, that this is a complex proposition. It is a complex proposition, perhaps not impossible, perhaps something that cannot be done.

But I want to ask what if, in fact, it turns out that this is not primarily a problem of market power? What if, in fact, and let us say there is maybe even a 30- to 40-percent possibility that it is not primarily a market power problem, that it is a supply and demand problem, and we impose these price caps or controls? From what I can understand of this, there is a tremendous risk that we would have substantially greater problems than we would otherwise have, and the blackouts would be more pervasive than they otherwise would be.

First of all, Dr. Hogan, I will start with you. Is my premise correct? That is, that if we are incorrect about our assumption, basing all of this on the significance of market power and it turns out to be other things, are the risks of imposing caps into those circumstances great?

Mr. HOGAN. I think the answer is yes. That is why I made the point earlier that I think the diagnosis of what the problem is, is critical in deciding what to do.

Senator THOMPSON. Excuse me, but as I understand it, if, in fact, it is market power, then they are right. If you impose caps, then the inducement to hold back is not there any more, so you will come across with the electricity. Again, my concern is are we that certain that this is the cause, that we can go in this direction? And if we are wrong, what are the consequences?

Mr. HOGAN. Well, I think there are many causes, and I am not certain about which is the dominant effect here. That is why the proposal that the FERC is pursuing, this bid cap proposal, is attractive if we are going to do anything at all. That is because a bid cap is the most robust policy with respect to the problems that you are talking about. To the extent that it is scarcity and you have a competitive market out there, and it is not market power, the bid caps effectively become redundant. It is a complicated process to get it put in place, but they effectively become redundant.

And if you have market power out there and people are withholding, the bid caps target that problem exactly, and that is what they are trying to do to eliminate it.

This is a very delicate business because when you are trying to do this, there are many ways to get it wrong, but this is, I think, the most robust mechanism. That is why it is so important to be careful about trying to target the market failures, rather than just

worrying about making prices lower, because our objectives should not be just to make prices lower.

Senator THOMPSON. If I understand what you are saying, you sound to me like you are somewhere in the middle between market caps, on the one hand, and what FERC is doing today.

Mr. HOGAN. I would not characterize what FERC is doing today as a price cap, in the traditional sense. I think it is different, and the term of art is a bid cap mechanism. It does not determine what the market price will be. The market price can go up and down and varies with conditions at every hour and depending what plants are running and what is happening to the water in the Northwest. You do not have to decide those things before the fact. It adapts it the same way, trying to emulate what the competitive market would do, and so it targets the market failure. But it does not guarantee—you have to be candid about it—it does not guarantee that prices will be low because if there is a scarcity problem, prices will be high.

Senator THOMPSON. Dr. Joskow.

Mr. JOSKOW. Thank you, Senator Thompson.

There is one thing I would like to make crystal clear. Nobody who has done the studies of market prices, market behavior and market power in California in year 2000 has concluded that the dominant source of the price increases was market power. We have all recognized gas prices went up, demand went up, imports went down, NOX credit prices went up and have tried to take that into account in our analysis.

Merely \$5 to \$6 billion out of \$27 billion, I think that is the average of the various studies, are due to market power. I think that is a lot of money. It would be a lot of money to me. I have done a study with public data, the ISO has done a study with confidential data. Frank Wolak, Severin Borenstein, and Jim Bushnell have done a study with public and some confidential data, and they basically all come to the same conclusion. There is evidence of market power driving prices up above what would have already been high prices.

And Mr. Hogan wrote a very thoughtful paper criticizing some of these studies, and I am about to finish a response that recalculates our numbers. I would be happy to provide it to the Committee. I hope it will be done in a week. So that is my first point.

Senator THOMPSON. Is it fair to say, and do not let me keep you from your second point—

Mr. JOSKOW. Sure.

Senator THOMPSON. Is it fair to say that the confluence perhaps of all of these circumstances in this history put California in a situation where market power could come into play?

Mr. JOSKOW. Absolutely. This is not a conspiracy issue. This is a result of the conditions in California that provide suppliers with opportunities to maximize profits that lead to prices that are above competitive levels.

The second point I would make is that FERC is already applying a price mitigation program. We can call it whatever we want. I will not use the term “price caps,” but it does effectively cap prices at a certain level when it is implemented. I agree with Mr. Hogan

that is the appropriate framework because it is targeted on trying to simulate competitive prices.

I would like to see us at least explore whether we can expand the number of hours, and more importantly close some of the loopholes in the current program by bringing other States into the program as well.

And the final point I would make is that we have a lot of experience with applying mitigation mechanisms around the country. You would think from the public discussion of this that this is some new thing that has never been done before. It has been done. We have had bid caps and PJM for 6 months. We have had price caps in New York and in New England. It has not discouraged investment, it has not led to shortages. It has given folks the confidence that they can fix what were pieces of broken markets without unreasonable economic consequences.

So I think we have a lot of experience. If they bring knowledgeable people to the table to fix this problem, we can do it in a way that minimizes the concerns, the legitimate concerns that you have, and we need to recognize that none of these schemes are going to be perfect. We need to do the best we can in an imperfect world.

Senator THOMPSON. Thank you. Before I call on Dr. Makovich, we always or oftentimes go back and get the statements of experts or academics and cross-examine them with them. I want to turn the tables a little bit here and point out that Dr. Makovich wrote, in April 1997, an analysis of the California market, and said, "There is no reliable mechanism in California to pay for the fix and operating costs of new generating facilities, since the means for doing so, that is, long-term contracts and high ancillary service payments are unlikely to be widely available for several years, given the rate for these and above-noted trend toward low PX prices. This is likely to lead to extended periods of low prices, followed by periods of very high prices, as supply shortages and surpluses develop. Price volatility will not be conducive to a smooth transition to competition."

Congratulations, Mr. Makovich. Not only apparently was this foreseeable by some, it was foreseen. I understand the folks at Bonneville, in early 1999, pointed out that it looked like there was going to be some hydro shortages in the Northwest. So that is a parenthetical. I do not want you to move too far away from the question I ask, and that is the consequences of getting it wrong.

Mr. MAKOVICH. Right. Well, I think the consequences of getting it wrong are very serious. For example, it has been mentioned today it would be a good idea to exempt new supply from any kind of price cap proposal, but it is important to realize, as we look back over the decade of the 1990's, a major source of new supply in this country, if not the majority of new supply over the first half of that decade, came from the refurbishment and investment in existing power plants.

And so we are either going to create a disincentive to investing in power plants and improving efficiency, and availability and capability, or we are going to create a very complicated review process, where people are going to have to try to argue what percentage of my plant is now new capacity versus old capacity.

We have already seen, within the past week, an announcement that 500 megawatts are not going to be developed in California by a major supplier who had a site that was permitted, and they were ready to go on construction.

And, finally, with this idea, there is a bit of a circular argument here with withholding capacity. The conditions of the very inelastic supply and demand curves only exist in a shortage so that the only way it is rational to withhold is if you have got a shortage. So to argue the shortage is caused by withholding is a bit of a circular argument, and there are problems with the basic data. People are running these power plants far harder this year and last than they ever did before.

So the basic data here is something that has to be looked at far more carefully to come to the conclusion because it is a very dramatic accusation to somebody that they are withholding capacity and supply from this market—

Senator THOMPSON. You could ask why they did not withhold in 1998 and 1999, I suppose.

Mr. MAKOVICH. It would have been worth a lot more to them to do so.

Senator THOMPSON. My time is up, but obviously—

Chairman LIEBERMAN. Do you want to have the last word?

Mr. BORENSTEIN. Well, actually, it would not have been worth a lot more to them to do so. In 1998 and 1999, there was a lot more supply, and the economics of withholding were much less attractive in 1998 and 1999.

Put simply, the right question to ask is, when you put yourself in a position when the ISO is near a blackout, they have 2-percent reserves left, and you own 6 percent of the capacity in the State, what do you bid? And the answer is whatever you can get away with, and that is not to demonize the generators. They are out there trying to make money. That is what they are supposed to do. Our job is to create markets where when they try to make as much money as they can, they end up helping consumers.

But it is a fantasy to say that this is a market in which generators cannot exercise market power. It is a serious issue. I do want to respond to Senator Thompson's question that it would be a major disaster to set the price caps too low. We saw that last November when we had this 250 price cap, and the price of natural gas went too high, and generators did the rational thing and shut it off. That is exactly the 1970's all over again, only worse.

However, it would also be a major disaster to simply walk away and pretend there is not a problem here. Because at those times of peak demand, if we have no price mitigation, we will have billion-dollar prices. There is just nothing to stop it.

Chairman LIEBERMAN. Thanks, Dr. Borenstein.

Thanks, Senator Thompson, and thanks to all of you. It has been a long hearing, but it has been a very productive hearing. I think we have all learned a lot about the situation in California, and frankly about FERC, and you have helped us to get ready to ask some constructive questions of FERC. I do think that there is agreement that the rates in California now are not just and reasonable, that FERC has some role to play here, although there is a disagreement as to what the role is.

The other thing I have heard is that no one thinks, in spite of the drop in prices out there in the last few days, that the crisis is over or that everything is going to be OK this summer. So this calls on us all to continue to work together. And I hope that some of the kinds of discussions among technical people can occur that many of you described, and that may get us some way forward.

Anyway, thanks for taking the time to come here. Thanks for sharing your expertise with us. It has been a very productive morning.

The hearing is adjourned. Thank you.

[Whereupon, at 1:19 p.m., the Committee was adjourned.]

THE ROLE OF THE FEDERAL ENERGY REGULATORY COMMISSION ASSOCIATED WITH THE RESTRUCTURING OF ENERGY INDUSTRIES

WEDNESDAY, JUNE 20, 2001

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Committee met, pursuant to notice, at 9:35 a.m., in room SD-106, Dirksen Senate Office Building, Hon. Joseph I. Lieberman, Chairman of the Committee, presiding.

Present: Senators Lieberman, Durbin, Torricelli, Carper, Carnahan, Thompson, Collins, Voinovich, Domenici, and Bennett.

OPENING STATEMENT OF CHAIRMAN LIEBERMAN

Chairman LIEBERMAN. Let me ask everyone to take their seats and we will begin the hearing. I appreciate very much the presence of all of our witnesses and guests. I wish you good morning and I thank you for joining us today as the Senate Governmental Affairs Committee continues its hearings into how the Federal Government has conducted itself in response to the deregulation of the U.S. energy industries, with a particular emphasis, of course, on the cost and supply of electricity in California and the Western United States.

Last week, we heard from five economists, including Alfred Kahn, the father of deregulation himself. They agreed that the California market was so dysfunctional that the Federal Government needed to intervene and temporarily regulate. On Monday, the agency that oversees electricity rates, the Federal Energy Regulatory Commission, which is known here in Washington by the acronym FERC, agreed to take action.

Today, we are going to hear about FERC's latest order and whether or not it adequately carries out the Commission's statutory responsibility to provide just and reasonable rates for electricity consumers in California and the West.

I must say that I am relieved that the Commission has asserted itself more aggressively to address the severe problems in Western power markets, although I remain concerned that even at this late date it has not done all that it could. The price limits established by FERC may still be too high, and ratepayers in California and in other Western States may still deserve substantially greater refunds for overcharges that have previously been imposed for them.

We are very fortunate today to have most of the key participants in this complex matter as witnesses before the Committee, including Governor Gray Davis, the Governors of North Dakota and Montana, Representatives from the State Governments of Oregon and Washington, the five members of FERC, as well as three distinguished colleagues here in the Senate.

To put this hearing briefly in historical context, let me say that Federal oversight of wholesale electricity sales began in 1935 when Congress passed the Federal Power Act mandating that prices for electricity be just and reasonable.

Originally, those oversight duties were assigned to the Federal Power Commission, which in the 1977 reorganization of the Department of Energy became FERC. The Federal Power Act remains, however, the primary statute governing FERC oversight of wholesale electricity sales. And the law requires that all rates in connection with the transmission or sale of electric power under the Commission's jurisdiction shall be, "just and reasonable and not unduly discriminatory or preferential."

FERC is authorized upon outside complaint, or its own initiative, to investigate prices that appear suspect. And if the rates are found to be unjust or unreasonable, the Commission is obligated to take remedial action, including the ordering of refunds to customers.

Traditionally, FERC has met its obligation to ensure just and reasonable rates by ordering rates that provided for cost recovery plus a margin of profit, in the same manner that most State public utilities authorities or commissions have done for generations.

More recently, FERC has allowed market-based pricing or proxy pricing, such as it ordered Monday, to be the standard for just and reasonable.

No matter what the methodology, FERC remains responsible for ensuring that the wholesale markets operate competitively and that the rates they produce are just and reasonable.

As the Committee heard last week, in 1996, California enacted legislation to deregulate its electricity markets beginning in 1998. To put it mildly, it has not been an easy transition, either for California or other Western States, because of record prices for electricity, supply shortages, rolling blackouts, and price spikes for natural gas.

The transition to deregulation prompted the bankruptcy and near bankruptcy of major investor-owned utilities, and in an extraordinary development, the State of California has now assumed responsibility for wholesale power purchases.

So as I see it, the question today is: Has FERC responded adequately to this crisis? What is the record? Last July, almost a year ago, FERC began a staff investigation into electricity problems in the West and a formal investigation into California prices. In a December 15 order, FERC concluded that the California market was deeply flawed, which, when combined with other factors, caused electricity prices to be neither just nor reasonable. So the Commission ordered changes in the California market and established a procedure for refunding excessive charges.

Yet in March and April of this year, as the Commission began implementing that procedure, it also significantly limited the num-

ber of transactions subject to refund and the circumstances under which prices would be mitigated.

In April, the Commission also initiated a formal Federal Power Act investigation of the Western electricity market. Two days ago, FERC expanded those actions by setting a soft cap on energy prices, around the clock, and regionwide.

In my opinion, the Commission's record in this matter raises serious questions about whether it will, and has, adequately overseen newly deregulated energy markets. It has been very slow in responding to this real and painful crisis. While the Commission by its own admission has had the authority to intervene to ensure just and reasonable rates, it has been surprisingly reluctant to do so. It did not initiate a formal investigation of the Western market outside of California until April of this year. In the past, when it has intervened in response to California's problem, the result has fallen short of what the public interest required.

I, of course, hope that Monday's order will be more successful, but I continue to have substantial concerns. I believe the order addressed the matter of refunds for electricity in California in an unsatisfactory manner, and it did nothing for refunds for consumers elsewhere in the West.

Monday's order will constrain some price spikes and close some loopholes in the previous FERC order, and that, of course, is all to the good and appreciated. But will it ensure that electricity prices in California and throughout the West are just and reasonable? That is not only the bottom-line question, it is the law. And it is that question that I hope our witnesses will address this morning.

Senator Thompson.

OPENING STATEMENT OF SENATOR THOMPSON

Senator THOMPSON. Thank you very much, Mr. Chairman. I think it is obvious to all of us that California is in a state of crisis. Two of its largest utilities have gone under or one has taken bankruptcy. California bonds have been downgraded on two occasions. Producers, suppliers, who the State is going to have to depend upon for additional supply in the future, are expressing concerns. Some projects now have been delayed. We have seen blackouts, and we are told that, apparently regardless what happens from here on out, we are locked into future blackouts this summer. It is of concern to all of us, not only from a humanitarian standpoint but from an economic standpoint. California, of course, is extremely important to the rest of the Nation from that standpoint. So we are addressing the question of what to do about it at this stage of the game and who is responsible.

I am reminded, as I look at this, of the wisdom of the Founding Fathers and the system of federalism that they created, and that was that we should have responsibility at two different levels of government, and one of the reasons for that was to assess accountability. And if there was ever a place where we do not have federalism, it is here. We have a split system where the State is responsible for the retail market, as it were, and a Federal system where the Federal Government has some responsibility in terms of wholesale prices with regard to private suppliers. And it ensures that no one will really have to accept accountability when things

go wrong, and that is one of the reasons, of course, we are seeing all of the finger-pointing and the blame-gaming that we are seeing now.

But it is true that this hearing today has been focused on FERC. I think it is unfortunate. I see we have five panels here, and a certain thing in some businesses they refer to as “prime time,” and FERC’s appearance is not in it. And I certainly hope that we have at least a semblance of the interest in hearing the FERC testimony, which is supposed to be the primary subject of this hearing when they come on sometime probably mid-afternoon.

But they do have a responsibility in certain areas, and part of that has to do with just and reasonable prices, whatever that may be. The idea of a Federal agency deciding what is just for something as important as this would be laughable in any other context, but that is the law, and that is what we operate under.

That has led many to call for hard caps. Constituents and elected leaders, after thoughtfully mulling over this for long periods of time come down on the side of lower rates instead of higher rates. But we know that in any long-term sense, anyway, that generally speaking caps do not work when supply is the problem. And neither the FERC while President Bush is President or the FERC while President Clinton was President has thought that hard caps were a good idea. In fact, the prevailing opinion is that when supply is the problem, they make a bad situation worse.

Now we are told that this is different, this situation is different, that we can apply a Goldilocks test to this one and we can get the rates not too high, otherwise, they would be ineffective; not too low, otherwise, we would drive supply out of the market; and we would lift it just at the right time and all of that would work out, although I see no model for that in history anywhere. There are a lot of very credible people who think that that is the way to go.

So there has been tremendous pressure on FERC because of that. They have taken several actions. I was reading a summary of the written testimony of FERC Commissioner Linda Breathitt. She says that since last August, FERC has issued 50 orders implementing important remedial measures and price mitigation, instituted investigations into rates and market design flaws, established programs to maximize electricity supply and delivery and demand reduction, and directed sellers to provide refunds.

And, of course, those refunds, rebates, are an important part of this process. It does not shock me to find out that in a matter involving this much money and this many people and this many suppliers that there probably have been some out there who have not behaved as they should, even though I see no allegations of criminal activity—at this point, anyway. Those investigations are ongoing, and they should be ongoing. But for most people, the idea that this problem was caused solely or even primarily by that is far-fetched, to say the least. So let that play out as it may. Let’s acknowledge that that might be a part of the mix.

FERC, on April 25, of course, entered into a price mitigation system. Prices have dropped since that time. Now we are switching somewhat from a blame game to a credit game, and everybody is scrambling to claim credit for the recent drop in prices in California, and we will watch that play out with some interest. But

now they have expanded the price mitigation system. It is not a hard price cap, and it is not price controls in the normal sense of the word, I would think. But it has been expanded to all of the Western grid and to an around-the-clock operation.

However, some people believe that this problem has to do with more than just a Federal agency fine-tuning wholesale prices, and I am one of those. And some people believe that to determine where to go, it is good to consider how we got here in the first place.

Now, for Governor Davis, the answer is simple. A bunch of Texas cowboys got down at the corral and decided they were going to take advantage of helpless California, and we are seeing the results of it. In fact, we have seen no shortage of villains. The governor at one time or another has blamed Federal regulators, State regulators, the President, suppliers, the former governor, and a bankrupt public utility.

However, I think we need to cast our net a little wider. Clearly, there are other factors at play. We know, for example, that we had a drier Northwest during crucial periods of time that cut back on the hydropower that the West normally sent down during the summer months and that California depends on. We had an inordinately hot summer. We had an inordinately cold winter. During all of this, we were experiencing increased demand throughout the West, and especially in California because of the growth of that part of the country. It was clear that California was becoming more and more dependent upon imports.

Surely, none of us can blame anyone for those factors, but the other interesting point about that is none of those factors were secret developments. One would have thought that State officials might have noticed those things as they were occurring, especially since they were getting warnings as early as early 1999 with regard to the problems in the hydropower situation, at least.

Other factors, of course, enter into play, and that has to do with the policies of California, the policies of the Public Utility Commission, and the governor. No power plants in 10 years. The governor is not responsible for most of that. But capped retail rates at a time when the utilities were locked into spot markets, which everybody acknowledges was a mistake. When deregulation came about, we had a supply surplus of about 30 percent in California. That situation, as we saw, rapidly changed, but the policies did not change with it.

So PG&E was paying 30 cents and selling for 3 cents and, of course, ultimately went bankrupt as they were saying last year that they needed relief and others were saying they needed relief. No relief was coming.

So no additional power, capped retail rates, locked into spot markets, a siting process that was longer than apparently anybody else's made it very difficult to put new power online. And then even more warnings from experts who were talking about the storm clouds that were looming, and then, of course, we saw shortages in May 2000.

So all of the policies that were clearly a part of the problem were locked into place and kept there until the problem became a disaster. I think that it is instructive to look at other States around

the country that have deregulated, that have not had similar problems. They did not have some of the natural problems either that California had, in all fairness, but they did not have some of the policies or adhere to them the way that California did either.

Now, after blackouts are inevitable, apparently, according to the experts, some changes have been made. California now enters into long-term contracts, but apparently they are paying very high rates for the contracts, higher than spot markets. So when spot market prices were higher than long-term contracts, they were paying spot market prices. Now that long-term contracts are higher than spot market prices, they are paying long-term prices. A policy of buy high, sell low. And we do not know exactly what prices they are paying because California has not been willing to release the prices that California citizens are paying for the long-term contracts for municipalities, which, of course, continue to be large suppliers of power.

So I do not want to rain on anybody's parade here today as we bring FERC to task, but I guess, as Paul Harvey would say, perhaps we ought to look at the rest of the story and, before the day is over, perhaps a more balanced view we will have not only as to what should be done at the Federal level but as to how we got here in the first place.

Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, Senator Thompson.

It is a long hearing. We do have serious questions to ask. I assure you I will be here when FERC comes on, regardless of what hour it comes on. And in some sense, the morning testimony will pose questions which I think will be fair and reasonable both to those who are in the morning and to those who will follow in the afternoon.

As is our custom, we will now go to Members of the Senate who asked to testify this morning, though I do note the presence of a growing number of members of the California delegation. I do want to welcome them here. I see Congresswoman Jane Harman, Ellen Tauscher, Hilda Solis, Anna Eshoo, Joe Baca, Lois Capps, and Lynn Woolsey. And I thank you. Obviously your presence here is an expression of your concern about the ongoing problems regarding electricity rates in your State and your hope that we and FERC together can bring some relief to citizens and businesses in your State and to the economy of the State generally.

I am pleased to have three colleagues with us. I can go in alphabetical or seniority order. Do you have a—

Senator MURRAY. Seniority order.

Chairman LIEBERMAN. This is most encouraging. Your two colleagues from Washington State, acknowledging that you are obviously much older than either one of them, Frank, have yielded to you. So, Senator Murkowski, ranking member of the Senate Energy Committee, we thank you for being here and look forward to your testimony.

**TESTIMONY OF HON. FRANK H. MURKOWSKI, A U.S. SENATOR
FROM THE STATE OF ALASKA**

Senator MURKOWSKI. Thank you, Mr. Chairman, and let me thank the two gracious ladies on either side of me. I am most ap-

preciative that you included Energy and Natural Resources Committee representation here at your hearing.

Everybody seems to want to get in on the energy crisis at this time. There are many chairmen holding hearings, and that certainly is the prerogative. Some are even involved in spinning away their responsibility associated with the crisis in California. We have heard criticism of our President, of our Vice President, for being chummy and cozy with big oil, criticism that indeed the higher costs associated with the shortage are the responsibility of the administration.

It strikes me, Mr. Chairman, that if you have a sickness—and we have a sickness right here with the gentleman that just turned the chart over. It is upside down. [Laughter.]

He is relatively highly paid—or I mean he was.

Chairman LIEBERMAN. Of course, there was some chance that we were upside down and the chart was right side up.

Senator MURKOWSKI. Well, we have been accused of that, too.

Senator THOMPSON. I am glad we noticed.

Senator MURKOWSKI. But the point I wanted to make relative to the criticism of the President and the Vice President for being too chummy and out of the oil patch and part of the bad guys from Texas, I think somebody did a calculation that suggested that Texas-owned companies contribute about 12 percent of the energy that California consumes. But, ordinarily, if you have a sickness or a crisis of some kind, you address it with some degree of expertise as opposed to holding a public hearing. And I think the energy situation in this country is a sickness. You need people who know something about it, how to correct it, and how to bring about change. And I think both our President and our Vice President fit that category.

Now, we know something about energy as well, Mr. Chairman. We have held 24 hearings, Senator Bingaman and I. We have had 164 witnesses. And what we found is very simple: We must increase production, we must develop alternatives and renewables, and we must improve conservation. It is just that simple. And those that suggest it is more complex are leading you down either goat or rabbit trails, as the case may be.

We had a hearing in this room yesterday. We had FERC here. We had all five commissioners. And it was rather interesting because they did reach a conclusion. All five concluded that Congress should not legislate price control legislation or wholesale price caps, as the case may be.

I would also remind you that FERC is just recently up and running. They just obtained the last two members, and now they have a five-member commission. Further, both sponsors of the price cap legislation, Senator Smith and Senator Feinstein, have indicated they will not push for legislation to a markup on their proposed wholesale cap bill, which I think is relative to the action that FERC has taken and their belief that FERC is doing the job that they were set up to do.

Now, I commend the President and the Vice President for staying the course, staying the course against wholesale caps. This is the only way the energy supply will increase. If you put caps on, you will not get investment. We heard testimony given yesterday

by the investment community relative to the fact that if you have tight caps, there is not the incentive for investment. And the investment can go a number of places.

I think it is also important to point out that under the Bush Administration, FERC has taken their responsibilities seriously, somewhere between 30 and 50 orders, as Senator Thompson indicated, since they took over. Now, where was FERC before that? Well, they were running pretty lean. But, nevertheless, the crisis did not occur beginning in January. The crisis in California was in effect beyond that. And why FERC did not act, why, perhaps you could pursue that. Their just-issued West-wide order will further help both California and the entire Western United States.

Now, we do have the chart now right side up, and the point I want to make with that chart is that it is working.¹ What you are looking at is California's price structure relative to the peak power costs. And you will see it is down now to somewhere in the area of \$48, and when you compare it to what it was, nearly \$550 or \$600, I think you can see that it is moving in the right direction.

Now, basically, that FERC has done its part, the question is what must California do, and I think that is an important reflection on the responsibility of the Congress.

California, of course, has driven one investor-owned utility into bankruptcy and has put the other two on the brink of bankruptcy. The governor once said that he could solve California's problems in 15 minutes if he just let the true cost of electricity be passed on to the consumer. Well, you can ask him about that. But it appears that California has continued to try and hide the true cost of power by having the State now pay for it instead of the utilities. This puts the taxpayer of California on the hook for somewhere in the area of \$47 billion.

My question is: What is the difference between the ratepayer and the taxpayer? I find little difference. Although California officials accuse investor-owned power as being "pirates," they have done little to protect California consumers from power sold by municipally owned utilities that are within California's own authority.

A recent *Los Angeles Times* article reported that the city-owned Los Angeles Department of Water and Power was one of the largest moneymakers in the California spot market and made \$17.8 million. And I would remind you that is owned by the city of Los Angeles.

Further, California's problem is not lack of regulation. It is really a lack of generation. California bet it could stop building new power plants and instead import power from outside the State. California ordered its investor-owned utilities to divest their fossil fuel generation but exempted the municipal utilities. Why would they exempt one and not the other? Well, you can ask the governor.

California prohibited its investor-owned utilities from using long-term contracts for power and forced them to rely on the spot market. This strategy can work for a time when there is excess in that spot market. But it did not work when that excess was removed.

¹The chart entitled "California Day-Ahead Power Prices," appears in the Appendix on page 551.

California has taken steps to expedite power plant construction. It has let a lot of permits. But the question is: How many of those permits have firm take-outs from financial bodies that are prepared to back them without a degree of certainty on the rates that those investments are going to amortize?

So I think the jury is still out whether the California investor will want to build in California given the investment climate the State has created.

As we look at the issue, Mr. Chairman, of those that are alleged of profiteering, I am going to ask that this be included in the record, the "Top 10 in Profits."

According to the California independent systems operator say that they total \$505 million. Two-thirds of that are associated with British Columbia Power Exchange, \$176 million, Mr. Chairman; Bonneville Power, \$30 million; Los Angeles Department of Water and Power, \$17.8 million. There you have a significant portion of those overcharges, and they are municipally owned. In the case of BC Power, they are outside.

Finally, in conclusion, the solution to California's problems is more power plants of all types, natural gas, nuclear, renewables, and incentives for conservation. And you provide that incentive for conservation when you pass on the true cost of power to the consumer. Then the consumer will conserve, go down and buy a new refrigerator or whatever. FERC's order clears the way for Congress to focus on the national energy crisis that is affecting millions of families from coast to coast, not just California. Before the recent change in the Senate, we were on a course to bring President Bush's task force legislation to the floor, Senator Bingaman and I in a bipartisan package. As I have indicated, we have had the hearings. Senator Lott said at that time the energy legislation would be the next order of business after the Senate finished education. But under the new Senate schedule, energy has slipped on the Senate schedule. That is unfortunate in view of the fact that polling indicates that energy is the number one issue in the country at this time.

So now is really the time for action on a comprehensive energy legislation to bring about a long-term and meaningful solution to the Nation's real energy problems, and I am convinced that the time for talk is behind us. The time for action is now.

Thank you for the courtesies extended to me. I would ask to be excused. I have another hearing on the Energy Committee at this time.

Chairman LIEBERMAN. Thanks, Senator Murkowski. Thank you for being here.

Senator Murray.

**TESTIMONY OF HON. PATTY MURRAY, A U.S. SENATOR FROM
THE STATE OF WASHINGTON**

Senator MURRAY. Thank you very much, Mr. Chairman and Members of this Committee, for calling this hearing. In my home State of Washington, there is no more important issue than the energy crisis today. Two days ago, after months of delay, the Federal Energy Regulatory Commission finally woke up and took action against alarming energy rates. FERC, as all of you know, put in

place price controls that are similar to what Senator Lieberman and I and Senator Cantwell and others have been urging for months. I am glad that FERC finally came around, helping us bring some order to this volatile energy market, but this one step is not going to solve the energy crisis.

The energy crisis is very real, Mr. Chairman. It is not going away, and the Federal Government needs to do its part to help our communities. Today, I want to share with this Committee how the energy crisis is hurting Washington State, and then I want to offer six things that the Federal Government must do to protect our people and our economy.

Let me begin with the impact in Washington State. We have already lost thousands of jobs because of rising energy rates. Entire industries could be idle just to prevent massive rate increases. According to one estimate, Washington State could lose another 42,000 jobs over the next 10 years unless we take action. Not only are there economic costs, but there are environmental impacts as well, including our ability to recover endangered salmon.

I want to share with you a typical letter I received from a constituent in Washington State. Mrs. Valeria Mesler of Okanogan, Washington, wrote to me: "I am a 91-year-old widow living on my Social Security check each month, which is small. I cannot afford any increase in the cost of my electricity. I am sure there are many like me and also younger families on low incomes."

Mr. Chairman, she is right. There are thousands like her.

Today, the energy crisis is hitting our pocketbooks, and unless we act, tomorrow it will threaten our prosperity. Even Washington State schools are feeling the impact. Nancy Olson, who is the superintendent at the Ocean Beach School District wrote me that energy costs will add another \$200,000 to their budget. As a result, they are going to have to lay off the equivalent of 3.5 teachers. According to Superintendent Olson, "We have no extras anywhere in our budget. We will now have to resort to cutting teachers, which means increased class sizes." They are even, Mr. Chairman, considering going to a 4-day week in that school because of the costs.

Energy is impacting everything from our kids' education to jobs in our economy, to every family's personal quality of life and finances. We in Washington State are doing our part. We are conserving and we are cutting our energy use. Several of Washington's public utility districts have worked with consumers and have agreed to cut back on the amount of power they receive from Bonneville Power Administration. Last week, the Benton County PUD agreed to reduce its energy load by 10 percent. Recently, Clark Public Utilities, Franklin, and Ponderay and Grace Harbor PUDs have signed load reduction agreements as well.

People are changing their habits and buying more energy-saving products. In fact, in many parts of my State, you cannot even find a compact fluorescent light bulb on store shelves because they are all sold out.

We are also bringing new energy sources into service, especially renewable sources like wind. We have a 300-megawatt wind field being developed near Walla Walla and another 150- to 500-megawatt wind field planned for Prosser. We have a company in Kelso, Washington, that takes plastic from landfills and turns it into high-

octane, low-sulfur diesel fuel. We are doing our part. But we need the support and the leadership from this administration.

I, of course, am not saying that this administration caused this crisis. It did not. But I have believed that it has stood in the way instead of providing us the help that is critically needed. First, they identified it as just a California problem. Then, instead of urging conservation, they decried it as simply a personal virtue. And later, when we introduced bipartisan price cap legislation, the administration said no. Instead, they sent us an energy plan that focuses too much on drilling for oil and gas with very little support for alternative and renewable sources of energy.

Throughout, FERC has not done anything to help Washington State consumers get relief from predatory pricing. This week the administration's FERC appointees finally came around and accepted what we have been telling them all along, that we need price caps, temporary price caps, to protect consumers from outrageous rates. Frankly, I think the bipartisan legislation we have pushed has helped them make that decision.

Mr. Chairman, this administration has minimized this crisis for months, and people across my home State of Washington are paying the price. We are doing our part to conserve and to generate new, clean energy in Washington State. Now it is time for the Federal Government to do its part, and I want to quickly outline six steps I think we need to do at the Federal level.

First, we need a disaster declaration so that hard-hit small businesses can get low-interest loans from the Small Business Administration.

Second, we need real Federal support for conservation.

Third, we need to diversify our energy sources.

Fourth, we need to site new plants.

Fifth, we need FERC to keep its word and investigate price gouging in Washington State and other Western markets. If prices have been unjust, there have to be swift refunds.

And, finally, we need to make sure that as we expand our energy infrastructure, our oil and gas pipelines are safe.

Mr. Chairman, those are the steps we need to take at the Federal level to keep this crisis from getting worse. I hope that this administration will see the wisdom of acting now to protect our economy, our communities, and our citizens before it is too late.

Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, Senator Murray, for that testimony.

Senator Cantwell, good morning and thanks for being here.

**TESTIMONY OF HON. MARIA CANTWELL, A U.S. SENATOR
FROM THE STATE OF WASHINGTON**

Senator CANTWELL. Thank you, Mr. Chairman and Senator Thompson. I thank you for this opportunity to testify before the Committee today and for your leadership on this important issue.

The Senate Energy Committee, of which I am a member, has had numerous hearings on this issue, and I want to applaud Chairman Bingaman for the leadership and commitment that he has brought to this issue, and to Senator Murkowski for the number of hearings that we have, in fact, held for his attention to this issue.

Today's hearing focuses on a subject that I believe Congress must explore fully and, more importantly, be prepared to act on: The role of FERC. Our Nation's top energy regulator probably has never been more important than today.

As the energy crisis has evolved, I have had an opportunity to get to know all the FERC Commissioners and am pleased that we now have a full contingent of commissioners with two new members, Commissioner Pat Wood and Commissioner Nora Brownell.

Today, the FERC is in the unenviable position of being on the Congress' radar screen. I think it is important to keep in mind that this agency is in transition, responding to a brave new energy world. But as our recent experience in the Northwest has shown, the FERC has a long ways to go in its transition.

I am concerned about two things. I am concerned that the agency has been slow to respond, and even when it has responded, it has not always acted with equal vigilance from State to State. One cannot, as Senator Murray pointed out, open up newspapers in Washington State without finding stories about the energy impacts on our State, families, businesses, and community. As perhaps too few people realize in the midst of these bright lights shining on California, this really has been a crisis from which the Pacific Northwest has suffered. Yes, it has been exacerbated by a drought that has been the worst drought in 30 years. But, nonetheless, our need to go out and buy power on the spot market left us subject to rates 11 times what they were a year ago today.

The results have been devastating and have touched every part of our economy, from traditional energy-intensive industries such as aluminum and paper, to small businesses, farmers, and even technology companies. Thousands of people have already lost their jobs and plants have been shut down. A hospital in Washington State has experienced probably \$1 million in additional energy costs that will come off of their bottom line. Small businesses as diverse as grocery stores and hotels have already started adding energy surcharges. And this is despite an effort by most of these businesses to curtail their energy consumption by over 30 percent.

Governor Locke has issued a challenge for people and business in Washington to conserve 10 percent. Many businesses are reaching far beyond that and still seeing rate increases that are the same amount as what they paid for their entire energy bill last year. Our State's LIHEAP caseload is expected to rise by over 50 percent this year due to skyrocketing energy prices.

These facts point to an inescapable, common-sense conclusion—that the Western power markets have been dysfunctional for quite some time and that the electricity prices in the Northwest have been neither just nor reasonable. Like many of my colleagues, I want to say I appreciate the steps that the FERC Commissioners took on Monday, June 18, to help mitigate the impacts of the Nation's energy crisis and rein in the runaway electricity prices in 11 Western States. I am hopeful that these actions will help address the crisis in the Northwest.

However, during the hearing before the Senate Energy and Natural Resources Committee yesterday morning, I had an opportunity to ask the FERC Commissioner and the FERC's general counsel about my concerns given that we had not had a chance to read the

order. In response to my questions, I found one piece of information very troubling. That is, Mr. Chairman, despite a year of skyrocketing prices throughout the Northwest and other Western States, the FERC admits that it will not provide a mechanism for those in the Western States outside of California to seek refunds—this is a very important issue—other than refunds that would occur after July 2, 2001.

On the one hand, FERC has offered long overdue relief to Washington State consumers who are staggering from these high energy prices. But, on the other hand, it has taken away an opportunity for us to get these refunds. With the support of Senator Murray and other Senators from the Northwest, I am sending a letter to FERC Chairman Curtis Hébert today asking for a rehearing on the Commission's December 15 order in which FERC denied Puget Sound Energy's complaint regarding the West, outside California. We are asking FERC to set a refund effective date consistent with Puget Sound Energy's October 2000 filing.

Mr. Chairman, whether this refusal to consider consumer refunds outside of California is an oversight or an accident, it is certainly the latest in a series of FERC actions that have elicited questions and concerns from many people in my State.

Over the last year, people in Washington State have endured many impacts from this energy crisis, and I think it is very important that FERC go further in addressing this issue of repayment.

Mr. Chairman, obviously this Committee and the Congress in general, as policymakers, need to ferret out the many causes of FERC's slow-to-act performance in the face of this crisis, whether it is lack of a clear mandate arising from dramatic changes in the energy industry, a lack of necessary information or resources to do its job, or simply just a lack of will. But as we work to prevent such crises in the future, we also need to focus on how to correct the mistakes that have been made.

We know that there are Pacific Northwest communities that have been devastated by plant closures and job loss due to an unprecedented run-up in electricity prices and FERC's inactions and omissions. It is simply unacceptable that the Federal agency charged with ensuring that consumers are protected does not meet that responsibility.

With this in mind, Mr. Chairman, I hope that FERC heeds our calls to reverse its decisions on issues of retroactive refunds for Northwest consumers and applies the same standards of fairness to the constituents of my State as they have to ratepayers in California.

I thank the Committee for this opportunity to speak on this issue, which is important to so many people in Western States, and I thank the Chairman for holding this hearing and look forward to your continued oversight of this commission.

Thank you.

Chairman LIEBERMAN. Thanks very much, Senator Cantwell, and we will be sure to ask the members of FERC this afternoon some of the very relevant questions you have raised here this morning.

I note the presence of another member of the California House delegation. I am delighted to welcome not only to this hearing but

to the Congress Congresswoman Diane Watson. Thank you for being here.

Before the Committee calls the Hon. Gray Davis, Governor of the State of California, Senator Boxer, our colleague, has asked to very briefly introduce Governor Davis.

TESTIMONY OF HON. BARBARA BOXER, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Mr. Chairman, Senator Thompson, thank you so much for inviting my governor here. I promised you that I would make a minute, a minute-and-a-half introduction, and I will because I know how many people you have yet to come.

But I want to say that in California we need the help of everyone on this Committee. The reason we have such a beautiful delegation sitting behind me here is because of their deep concern. They have got many other issues on their plate. I think it shows and demonstrates that we are all speaking with one voice, that we need relief for our consumers, and our governor has been fighting this fight in the middle of a crisis that he did not make. And he has been doing everything he can to heed what Members of this Committee have said, which is to bring sources of power online to push the State toward energy efficiency and conservation, which we are succeeding at—we really are—and also to call attention to the gouging. And if I might say, that is the only word I can use, and I think when you hear the governor, you will understand why we use the term “gouging.”

Mr. Chairman, I think this Committee is key for us. You are an investigative committee. You are a Committee that is an oversight committee. It is very appropriate that you oversee the FERC. I believe with your leadership, Mr. Chairman, and others on both sides of the aisle, we have seen FERC finally look at their charter, which says they must protect against unjust and unreasonable prices. We have seen them take action. We in California welcome that action, and at this time, it is really my honor to introduce a man who has been working on this crisis day and night. It is a lonely and difficult thing, many times, and he has really done everything within his power to keep the power on in our State.

Thank you very much for welcoming him here, and thank you for your deep concern, Mr. Chairman, and also Senator Thompson.

Chairman LIEBERMAN. Thanks, Senator Boxer.

Governor Davis, I am honored to welcome you here. I appreciate very much that you took the time to come out and share your thoughts and your experiences with us. This is a hearing room that is often used by another committee. I am privileged to be a member of the Senate Armed Services Committee, and it does strike me that there are some parallels here. I feel like I do when we had leaders of our military come in from areas of battle to report on how the battle was going. It is not quite that serious, but you face a serious crisis that was not of your making. You have been tested. I think some of the improvement that is reflected in the charts that we have seen from Senator Murkowski you deserve some credit for. I am delighted to hear from you now, and I suppose the question is: How goes the battle?

TESTIMONY OF HON. GRAY DAVIS,¹ GOVERNOR, STATE OF CALIFORNIA

Mr. DAVIS. Well, we are making progress, and thank you very much, Senator Lieberman, and Ranking Member Senator Thompson. Thank you for inviting me as well. I want to thank our junior Senator, Barbara Boxer, for her friendship and for her introduction, and our senior Senator, Dianne Feinstein. They both worked very hard on price relief for California and the West, and I want to thank all of our Congress people that have been staunch allies in this. You have mentioned their names, but I would like to repeat: Congresspersons Tauscher, Harman, Solis, Eshoo, Baca, Watson—have I missed any?—Lois Capps and Lynn Woolsey. Did I miss anybody else? And there are many others who are not here. They are very busy, and I appreciate their taking their time to be here today. Obviously this is an important issue. That is why so many people have come today. I applaud the Committee for having this hearing.

I want you to know that California is doing its part to meet the energy challenge. As you know, there are two constructive things the State can do: Build more plants, conserve more power. We have approved 16 plants since I have been governor starting the fourth month I was in office. Ten are under construction, more than at any time in our State's history. We are also the most electricity-efficient State in the Union, as that chart, based on U.S. Department of Energy figures shows, and we are not resting on our laurels. It is in our self-interest to become even more electricity efficient as the summer proceeds.

Those two goals—building plants and conserving—are the major prongs of a long-term energy plan that we have put together for every Member of this Committee. Long-term contracts are also a big part of that, and I want to thank David Freeman, who is with me today, formerly of the Department of Water and Power—he helped negotiate those—and Michael Kahn who is president of our ISO, who is also with me in attendance today.

Let me just elaborate for a second on the building of power plants and conservation. As was noted earlier, for the 12 years before I was a governor, not a single major power plant was built in our State. Not one. But we began earnestly to right the ship, and as I said, we have licensed 16. Ten are under construction. Four will be online this summer. The first one a week from today will come online in Bakersfield. Two more will come online by July 7. Those three plants will provide roughly 1,200 megawatts of power. In addition, we have sited 10 peakers. Through my emergency powers, I have cut the permitting process to 21 days to site peakers. They represent more than 800 megawatts of power.

Part of our effort to get more plants online involve reducing the time to site permits. That was mentioned earlier. We have cut that in half from a year to 6 months, and I have reduced that even further through my emergency powers to 4 months.

So the combination of the plants online plus additional renewables, distributed generation, and re-rating of existing power plants we believe will provide 4,000 megawatts of power by the end of

¹The prepared statement of Mr. Davis appears in the Appendix on page 391.

September. Then we have 5,000 megawatts coming online in each of the next 3 years for roughly 20,000 megawatts by the end of a 4-year period. Suffice it to say, at no time in the history of the State have so many plants been under construction in California.

On conservation, we are not resting on that laurel. I signed the bill for \$850 million, which encourages more efficiencies in people's homes and places of work. Plus we signed an executive order which gives people and businesses a 20-percent rebate if they reduce their electricity by 20 percent any of the 4 months—June through September—of this summer. Plus we have signed agreements with 137 companies, including the Bank of America and Wells Fargo, Hilton Hotels, for them to reduce their consumption by 20 percent from June to September of this year. We have signed agreements with 225 municipalities, special districts, for them to achieve between 10 and 20 percent conservation. So all across the State, Californians are pulling together to build plants and to reduce electricity usage.

I think the proof is in the pudding. In May, it was reported that Californians had reduced electricity usage over last year by 11 percent and by 10.4 percent during peak periods. I think that is a remarkable contribution, but we are going to do even more.

So I think it is fair to say on long-term contracts, which have reduced our dependency on the spot market by roughly 40 to 45 percent, on building plants, more than any governor has done before, and on conservation, California is doing its part. The one mission element, at least until Monday, was any efforts to regulate the wholesale price of electricity. As the Chairman correctly pointed out, that is exclusively the function of the Federal Government. The State has no control over that, even if it wanted. Our only power is the power to advocate, testify, occasionally to shame, to make sure that action is taken.

As the Chairman also said, the Commission is responsible to see that rates are just and reasonable. That comes as a great shock to some people who think that market forces should take hold no matter what. I am going to speak to that a little later. But that is not the law. As Ranking Member Thompson pointed out, the law does require just and reasonable rates be enforced, and FERC by its own admission has allowed those rates to remain in effect, even though they made a finding November 2000, reiterated in December 2000, reiterated again in April 2001, that our rates were not just and reasonable and our market was dysfunctional.

Under law, the Commission must order refunds once they make a finding that a marketplace is dysfunctional and rates are not just and reasonable. Under law, if rates are not just and reasonable, they are by definition unlawful, and the ordering of refunds is not a matter of discretion. It is a matter of law.

Yet at every point where the Federal Energy Regulatory Commission could have restored some sanity to wholesale prices, it failed to do so. I have done my best for approximately a year to advocate, to urge, and to encourage appropriate Federal action. I have testified before the Federal Energy Regulatory Commission. I have written countless letters. I have spoken personally to Presidents Clinton and Bush. Our electricity oversight board, the independent service operator, and the PUC have made at least 100 filings for

relief. But in every case, even in the face of mounting evidence in support of our position, our requests have been denied or ignored.

Two days ago, the Federal Energy Regulatory Commission did bow to public pressure and took a step in the right direction. But here is what the Commission's inaction over the last year has yielded, and I refer you to the chart on the right where it says "Total Wholesale Cost of Electricity in California."¹ In 1999, Californians paid roughly \$7.4 billion for electricity. In the year 2000, with demand up only 4 percent, we paid \$27 billion, roughly a 400-percent increase in electricity costs. This year, we are on track to spend between \$50 and \$60 billion, even though we are reducing our electricity usage by roughly 9.5 percent each month. And as I explained to President Bush when we had a nice visit in Los Angeles, a functioning market in which the consumer is reducing use by 9 to 10 percent a month should produce a reduction in prices, not a doubling. So we are looking at ratepayers' paying 700 to 800 times more for electricity than they did just 2 years ago.

You will not be shocked to hear that Duke Energy Company acknowledged not too long ago that they charged the State about \$3,800 a megawatt in January. Reliant, I pointed out, charged us \$1,900 a megawatt on 2 successive days a month ago. So it is clear that the energy companies have exerted extreme power over our market and are driving up prices dramatically. That is why Governors Locke, Kitzhaber, and I, some time ago proposed cost-based pricing which would allow for a reasonable profit on a temporary basis until more plants could come online.

A number of noted economists, including Alfred Kahn, the proponent of airline deregulation, came before this Committee last week and spoke to the wisdom of temporary price relief for California and the West.

On Monday, the Federal Energy Regulatory Commission again refused to impose cost-based pricing. I want to thank Commissioner Massey for his long effort in that regard. I believe to this moment that that is still the most effective way to restrain prices and provide a reasonable profit.

Again, my thanks to our two Senators for their long efforts and our congressional allies, not just in California but throughout the West, who have worked night and day for price relief for the West.

On Monday, with two new commissioners, the Federal Energy Regulatory Commission did grant some price relief. I thank them for that. The commission did correct the most obvious errors in its April order, but it was months too late and there is much more for FERC to do.

The California ISO estimated that from May 2000 to February 2001, power generators charged Californians \$6.7 billion more than a competitive marketplace would otherwise warrant. They have recently updated those figures through May, and the overcharges are now \$8.9 billion.

To date, however, Mr. Chairman, not a single penny in refunds has been returned to California. I believe it is unconscionable if generators are allowed to keep these egregious overcharges. Mr.

¹The chart referred to by Governor Davis appears in the Appendix on page 742.

Chairman, FERC must move quickly to enforce the law. FERC must order these energy companies to give us back our money.

Then, finally, Mr. Chairman, FERC must turn its attention to natural gas. Until very recently, California natural gas prices were 2 to 3 times higher than the national average, and for a while they were 8 times higher. That was due in part to the fact that El Paso Natural Gas controlled a significant portion of the major pipeline into Southern California. It was not until that contract expired and was divided essentially to 30 other energy companies that the price started to come down and get close to what the rest of the country is enjoying.

So, clearly, FERC must be—I would suggest this commission could do a useful service in urging FERC to exercise its responsibility to enforce laws against manipulation on interstate pipelines to California.

Mr. Chairman, in conclusion, California will continue to do its part, building all of the plants California needs and setting an example for the rest of the country on conservation. With the greatest of respect, I would ask this distinguished body to do its part by joining us in holding the Federal Energy Regulatory Commission's feet to the fire. It is unconscionable that the commission look the other way while energy companies bilk Californians out of \$9 billion. Californians are due billions of dollars in refunds. Together we have made progress on price relief. Now it is time to move forward on refunds, not just refunds for California but refunds for the entire West.

Again, I thank you for the privilege of being here. I know there were a couple of questions earlier that were raised about California's activities, and if it is appropriate to respond to those questions, I will.

Chairman LIEBERMAN. Thanks very much, Governor Davis, for that excellent testimony. I think the record does make clear, as you have documented, that the State of California and the people of California have taken very significant steps forward in a most difficult situation which no Member of this Committee would want to have their State go through, to try to make things better. That says the obvious. I would say no governor of one of our States would like to have that State go through that either. Both in terms of bringing more power online through the State, but also in the very impressive conservation figures that are coming out now from California, which means that individuals, families, businesses understand the crisis and using less electricity, progress is being made.

We are focused, because we are Federal an oversight committee, on the Federal Energy Regulatory Commission. And as you said, and I said before, that is the group that we have been asking to do what you cannot do and no one else can do—that is, the State cannot do, and that is to deal with the wholesale price of electricity.

I wanted to ask you a few questions about the order that came out on Monday. The first is this—I am going to get to the nature of the price relief in a moment, but in its order, FERC provided price relief until the end of next summer, September. And my question to you: Is that enough time? In other words, can we expect

that by that time enough of the power plants that are now in the process of being constructed will be online, and conservation will be sufficient so that supply and demand will be equivalent or that supply will surpass demand and we can have a genuinely competitive market? So is September of next year sufficient time for the State at this point?

Mr. DAVIS. Well, as I said, I think the Commission's action is a step in the right direction. They will have to be vigilant to make sure that there are not too many loopholes and that the order is enforced.

We will not have, however, about enough power to meet our demand until sometime late in 2003. Alan Greenspan has said on a number of occasions that electricity deregulation really does not work unless you have 15 percent more power than demand. We will not get to that point until sometime late in 2004.

So, optimally, the order should extend at least until we get enough power online to bring demand and supply into equilibrium, and that will not be until late 2003.

Chairman LIEBERMAN. I will ask that question of the FERC Commissioners this afternoon, why they limited the order to the end of next summer and whether they are open to extending it if conditions suggest that they should.

My second question goes to this matter of refunds. In my own review of the law, it does seem to me that the statute is clear that if FERC decides that rates are unjust and unreasonable, not only that they have to take action prospectively but they have the power to act in a just manner, which is to order refunds.

In the order that came out on Monday, as has been testified to earlier, nothing was said about refunds for the overcharges outside of California along the Western grid. And I was struck, as Senator Cantwell or Senator Murray said this morning, that their electricity prices in Washington State have gone up 11 times, by a multiple of 11 in the last year.

FERC's new plan issued Monday, as I get it, is for a 15-day settlement conference presided over by an administrative law judge. So I wonder if you have had enough time to give a response to that as an adequate forum in which to try to obtain the refunds necessary for the State. And if you do not, what other avenues do you have available to you?

Mr. DAVIS. Well, as you suggest, there does not appear to be much guidance to the administrative law judge as to what to consider and how to proceed. Obviously, I believe California should have a seat at the table. So should the other States who believe they have been overcharged. And we would present information from the California ISO that is advised by many of the economists that you had testify before you last week and have come to the conclusion that Californians are owed at least \$9 billion in overcharges.

Again, the FERC itself came to that conclusion on three separate occasions, but it has taken no action to put money back in the pockets of Californians. So they have suggested that about \$120 million might be subject to refund, but there is an ongoing process that allows the companies to rebut that and put in evidence to the

contrary. The bottom line is no money has yet come back to California.

I do not know if 15 days is enough time to resolve this issue, but I do believe the FERC should get a clear signal from this Committee that refunds are part of its function. Yes, they have provided some relief going forward. It is not exactly what we wanted, but there is no question that it will have a downward impact on prices, on the real-time market. But that is only half the job. The other half of the job is to give us back the money that was wrongly taken from us. The Commission made the determination it was wrongly taken from us. They just did not follow through and order refunds.

What I would suggest is that at the end of the 15-day period, you call the FERC back to this hearing and ask what has happened, how much progress has been made, have States had a chance to make their case, and what is, in fact, going to happen on refunds. Refunds—I mean, as you know, there is really no justice if you have a right but no remedy. We have a right to \$9 billion, but there has been no remedy.

Chairman LIEBERMAN. Thank you. I agree with you. And let me just say that it is my intention, though the Committee has a lot on its agenda, that this is an important enough crisis, and it is a crisis, obviously, that affects the West, but it sets a precedent for how energy price and supply crises will be responded to by the Federal Government. So I intend to continue to exercise, on an ongoing basis, the oversight authority of this Committee with regard to FERC. And I hope that will be helpful to them and to people throughout the country.

Mr. DAVIS. If I may, Mr. Chairman, I might suggest that you put those questions to Commissioner Wood. I have had three conversations with him. I find him to be a very reasonable person. He suggested to me that he thought a more aggressive approach to refunds might be in order. So I think he might be sympathetic to—

Chairman LIEBERMAN. I will do that this afternoon. Thank you. Senator Thompson.

Senator THOMPSON. Thank you very much. Governor, welcome very much.

Mr. DAVIS. Thank you, sir.

Senator THOMPSON. Governor, you heard my opening comments, and they will lay the basis for some questions I have. I started off by saying that I admire you in many respects. I wouldn't wish your problem on my worst enemy. You certainly were not responsible for many of the things that occurred, certainly as they developed before you became governor a couple years ago. I was especially impressed by the fact that you said you had seen all my movies. [Laughter.]

Chairman LIEBERMAN. Late at night.

Senator THOMPSON. Which makes two of us, now that I have calculated. Perhaps you can talk to the Chairman about salutary effects of that. But you have made some pretty pointed comments concerning other people. You have made some here today. I have made some. And I am sure that you understand from one elected official to another that it is appropriate that we get into some of the history of this and some more pointed comments and questions.

And I appreciate the fact that you do not shy away from that and you come here today and present yourself for some of those questions.

So having said all that, I want to ask you how it was that you seemed to let things get totally out of hand. My information is that back as far as 1998, the California Energy Commission warned of possible energy shortages as early as 2000. In February 1999, Bonneville put out a warning concerning the problems as far as hydropower in the Northwest. In July 1999, the CEC once again warned of short supplies. All this time, of course, you are becoming more and more aware, and, of course, last summer, a hotter summer than normal, the lack of moisture in the Northwest, all of the other factors that we have mentioned concerning increased demand—I think your electric power demand from 1996 to 2000 increased by about 24 percent. You were obviously becoming more and more dependent on imports for your power. May 2000 spikes, shortages, California's first two-stage alert. January of this year, a letter from 20 prominent economists saying it would be a fateful mistake to proceed with current policies such as the price caps and the spot contracting.

All of those things obviously developed over a period of time, it looks like a couple of years. But they were there for anyone to see. Did you see these developments as they were occurring? Did they cause you concern? If not, why not? And if you did, why didn't you act sooner?

Mr. DAVIS. In my testimony, I made clear, Senator, that we started licensing plants my fourth month in office. I became governor in January 1999. We talked about electricity usage increasing from 1996 to 2000. I came in in 1999. We started approving plants in April. That first year of 1999, before this matter was really—had not really been chronicled, it certainly was not in the newspapers with the regularity it is now, we approved six new plants.

When the matter worsened in 2000, particularly in San Diego, which experienced the full frontal effect of deregulation, we passed appropriate legislation to relieve the problem there, and I began testifying in front of the FERC in the fall of 2000 after a San Diego meeting.

So I have spent an inordinate amount of time on this issue. It is obviously important to the growth of the economy in the West and in California.

But just to put a couple things in perspective, according to the U.S. Department of Energy, 85 percent of the growth of electricity in the West in the last 5 years has been outside of California. We have, as you can tell, a very enviable record on conservation, and that is not just the product of the work that I have been engaged in with our legislature. But for 20 years, we have been requiring energy-efficient buildings, appliances, all kinds of things which have reaped benefits for our State.

So we have been working on this for a very long time, and to suggest otherwise is simply not accurate.

Senator THOMPSON. Well, I see my time is up. I would ask you, though, to—I want to ask one more question. You can answer it now or later, if I might.

Mr. DAVIS. It depends how hard it is.

Senator THOMPSON. I will just take a few seconds.

I take note of what you said, but in the eyes of many people, many more fundamental problems were not addressed, for example, the lifting of the retail caps. Mr. Kahn, who, as you correctly pointed out, testified here last week in favor of caps, said that the idea of keeping these retail caps on was ridiculous. You acknowledge yourself that you could probably solve the problem if you wanted to raise rates. So you have the combination of keeping the retail caps on, forcing the utilities to buy on the spot market, which was great when the spot market was not, not good when it became high. The approval process, the siting process, you addressed after the blackouts occurred, I believe.

These are fundamental structural things, I think, which all investment advisers—we have had Bear, Stearns, Goldman, Sachs and others testify—say that these were structural things that clearly, regardless of who was responsible for how you got to that point, that clearly had to be addressed. And now they are being addressed at a price that is much greater than you would have had to have paid had you addressed them last year, last summer, when the crisis was obvious to everyone.

So do you not claim—or do you not accept any responsibility for not having addressed these structural problems that were inherent in your system that obviously had to be changed when so many of the circumstances were changing, especially in light of your emergency powers, if you needed to exercise them?

Mr. DAVIS. First of all, it is nice for us to sit back here and talk about passing on the true price of electricity. But let me assure you, if I passed on a 700-percent increase to the citizens of California, there would be an outrage the likes of which you have never seen, and electricity deregulation in this country would not benefit from the—

Senator THOMPSON. I do not think anybody is suggesting a particular price here today.

Mr. DAVIS. Well, but I do not know that—I do not think you have, Senator, but I believe I have heard many people say why didn't we pass on the true price of electricity. The legislature and I believe it is important not to shock our economy into recession, and so we have phased this out over about a 10-year period. The highest residential user this year will get about a 45- to 50-percent rate increase. We did increase rates in January of this year. They went up again 2 or 3 months ago. There are also a number of incentives for conservation no matter what your rates are, and the people who are the most efficient, who just use 130 percent of baseline usage, do not see their rates go up.

But we are trying to manage a system which, as your question suggests, was basically flawed. The bill that passed in 1996 unanimously, with every Democrat and Republican voting for it, and the previous governor signing it, deregulated the wholesale market but not the retail market. The flaws of that did not become crystal clear until sometime in 2000, and we began earnestly taking steps above and beyond the steps we had done in 1999 to improve the siting process and to put new plants online.

So, everybody benefits from hindsight, but I make no apologies for the aggressive efforts we have taken to correct situations that we inherited. I did not, as you suggest, cause the electricity problem. President Bush did not cause it. Obviously it is on our respective watches. We have to try and manage it as best we can for the people of our State. And I think we are doing that.

Senator THOMPSON. Thank you.

Chairman LIEBERMAN. Thank you, Senator Thompson.

Let me just say for the record that it is my understanding that in almost all States that have deregulated electricity prices, retail caps, caps on retail prices for a temporary time period are the rule, the custom. That is the norm, usually. And so what was adopted here I know had an adverse effect because of all the other things that went wrong. But I would just make the point that if, in fact, California electricity customers were forced to pay the true price of electricity as it was being fed into the State, I think unfairly, very unfairly, it would have not only been a jolt to your economy and the American economy, because you are almost 15 percent of the national economy, but I honestly think it would have terminated the movement toward energy deregulation. I mean terminated the deregulation of energy which is occurring across the country, and is, generally speaking, I think the way to go.

So I think what is on the line here in your response to this crisis and FERC's response is not only how this Federal agency is doing, but whether we are going to continue to enjoy the benefits of deregulation.

Senator THOMPSON. Mr. Chairman, if I may just point out, I think that the issue is not a very good solution versus a very bad one. I think the issue is a choice between two bad solutions and whether or not by allowing more of the true price to be passed on we are creating a larger problem down the road.

Chairman LIEBERMAN. This dialogue could go on a while, but I think we will hear more of it as the other Senators question. I am going to call on Members as they arrive, going from Democrat to Republican. Next is Senator Durbin.

OPENING STATEMENT OF SENATOR DURBIN

Senator DURBIN. Thank you, Mr. Chairman. Governor Davis, thank you for joining us.

Mr. DAVIS. Thank you, sir.

Senator DURBIN. I have listened to your plight with great interest. You would think that if you are from Chicago or Illinois, far away from California, it would just be an academic endeavor. It is not. We have faced natural gas price increases, home heating cost increases over the last winter that are at record levels in Illinois. We have just seen a run-up in gasoline prices, which mercifully are starting to come down again. And it has sensitized people across my State and I think across the Nation to the fact that this is not just California's problem. This is a national energy debate.

Sadly, your State and the people living there have been the first victims of some of the worst things that have occurred here. But what I find interesting is that the debate usually centers on whether or not there is an understanding of market forces. And those

who want to explain away what has occurred in my State and yours say you just do not understand supply and demand.

I think behind that statement is the suggestion that we can trust supply and demand, that we can trust the market forces when it comes to energy. And yet for a long time here in Washington, we have come to the opposite conclusion.

In 1935, when we created the Federal Power Administration, we basically decided that energy was so important to our Nation's future and that the energy corporations so unpredictable that they could not go unguarded or unsupervised. So from 1935 forward, we said we as a government, as a people, will regulate this market, this industry. It is just too important to ignore. And I think that brings us to where we were a few years ago and where we are today.

In 1996, as States like your own embarked on deregulation, before you were elected governor, I can tell you that repeatedly the folks from the industry came to us and said, Washington, get out of the way, we do not want you involved in this. Every State is going to come up with its own solution. One size does not fit all. This is not a national thing to do. Let the States do it.

And as you have noted, and Senators Thompson and Lieberman, in 1996, when Governor Wilson came forward with his plan, it passed unanimously in the California General Assembly, which is probably a rare occurrence on an issue of this complexity. And so those who were second-guessing whether that California deregulation was smart or not so smart have to understand that in the context of 1996, virtually all the parties to the debate said this is the way to go, setting the stage for what happened to California and to your administration just a few years later.

I think that is a background which we should not lose sight of. As we look at this today, we should be reminded that 66 years ago, this Congress created the precursor to the Federal Energy Regulatory Commission and said: Watch this market, watch energy in America. There are things here that can happen that are devastating. California sadly today is on center stage as we look at the results.

Let me ask you about a couple things in particular. First, you have suggested that California should have a seat at the table in this discussion. I wholeheartedly agree. I think the residents of all the States should have a seat at the table. Sadly, this debate comes down to a face-off between the energy giants and the giant bureaucracies, and there seem to be some groups that are absent here, including families and businesses and others that are going to get nailed if we let the market run amok.

I have proposed a consumer energy commission that will involve all three, not only the producers and the regulators but also the consumers, so that they could have a voice at the table about the need not only for generation and conservation but also, as in your remarks—and I thought this is critical from where I live—stabilization so that there is predictability, so a business knows from month to month or week to week the parameters of potential energy increases.

I would like to have your comment on that, and particularly I would like you to address your repeated suggestion, which I can

surely understand, about this need for a refund. FERC has the authority to give refunds. They have not addressed this issue. As I sit here I do not know if historically they have ever considered doing that. But I would like you to comment on that refund question, what it would mean to your State and whether there is any precedent that you are aware of at FERC for such a refund.

Mr. DAVIS. Well, first of all, I appreciate your description of the background to the situation we currently face in California. It was accurate and well done.

Obviously, refunds are a primary way of policing the market, and if the Federal Energy Regulatory Commission is supposed to be a watchdog for the consumers—and that was the original notion back in 1935—then their primary vehicle is to provide relief, not just prospectively but retroactively. It is one thing if—well, I was going to give an analogy, but I will not.

So it is helpful to know that maybe we will not reach \$60 billion this year, although we are halfway through it, in expenditures for electricity—a little shocking when you realize it was just \$7 billion 2 years ago—but that does not fully balance the equities since we have shelled out far more money for electricity than would be the case.

All I can say is that whether or not there is a precedent for refunds of this magnitude, they are owed, they should be paid, and this oversight committee I believe, and with respect, should hold FERC's feet to the fire and ensure they issue the orders to give us back our money. That is the only message the energy companies will understand. If they have to reach in their pocket and write a check back to Californians, they will think long and hard before they take advantage of the market again.

And in response to your question, Senator Lieberman, I consider myself a marketplace Democrat. My parents were actually Republicans. But this is a special market. You cannot store electricity, unlike any other commodity. The user has to have it on the day they need it, whether you are on a fixed income, whether you are a police station or a hospital, and the seller has to sell it on that day. And so you do need some kind of buffering situation, and the umpires in this contest, if you will, are the Federal Energy Regulatory Commission. They need to see themselves as the—again, another analogy—circuit breaker to make sure they step in when there are problems. And the best remedy, I think, is refunds. That sends a very clear message.

Senator DURBIN. Thank you, governor, and I just in closing would say to the Committee here, your tragic experience in California has taught some national lessons, and I think particularly in the area of conservation. You have given us some real guidance as to what we can do as a Nation to deal with energy and view conservation as more than just a personal virtue.

Thank you.

Mr. DAVIS. Thank you, sir.

Chairman LIEBERMAN. Thanks, Senator Durbin. Senator Collins.

OPENING STATEMENT OF SENATOR COLLINS

Senator COLLINS. Thank you, Mr. Chairman.

Governor Davis, I would like to join my colleagues in welcoming you this morning. Although Maine and California are far apart geographically, we actually have quite a few things in common. We each have beautiful coastlines. We were each early movers in electricity restructuring. And both of our States have citizens that recognize that women make great Senators, although California has not gotten the party affiliation right yet.

There are also, however, some major differences, particularly with how our States have handled electricity restructuring. Maine has been steadily building new power plants. California went a decade without building any. Perhaps most important, Maine did not make California's fundamental error of artificially capping retail rates.

Fixing retail rates, even in the face of power shortages and escalating wholesale rates, has clearly been a disaster for your State. You cannot expect the benefits of a free market if you have a market which is not free.

Nevertheless, as I said at last week's initial hearing, electricity markets are not like other markets. By its very nature, electricity is a unique commodity. It cannot be stored or inventoried. It is sold continuously on the spot market at prices that may vary widely.

We had a case last summer in Maine where the spot price for a megawatt of electricity went to \$6,000, which is more than 100 times its usual rate. And, obviously, it is very difficult, if not impossible, for most consumers to respond to price spikes by turning off air conditioners or doing the laundry at a different time.

So it seems to me that while it is fundamental that electricity markets must first and foremost be structured properly, they can also create instances where they do not operate in what FERC calls a workably competitive manner because consumers are not aware of price spikes. Therefore, I believe that FERC's actions to mitigate prices appear to be reasonable.

But while it is important that FERC take action in the clearly dysfunctional California market, I would caution the Governor of California to be careful about what you ask for. While it may be tempting to ask FERC to exercise even more control of the California market, I know from our experience in New England that there may well come a day when you will wish that FERC would exercise less control.

In New England, FERC decided that we needed to give generators more incentives to build capacity, so FERC increased what is known as the installed capacity fee. This is a fee that is paid by consumers to generators to encourage additional generation. What was really striking was that FERC ordered a 50-fold increase in the I-cap fee over the level agreed to by a supermajority of the members of the New England Power Pool and recommended by the New England independent system operator.

It is ironic that FERC ordered this increase despite the fact that FERC's own report shows that New England already had plenty of capacity, and it is even more ironic that FERC ordered this fee in New England when the region with the biggest capacity problems, California, has no I-cap fee at all.

Governor, with better planning, your State will eventually be where Maine is today. You will have adequate generating capacity

to meet the needs of your State. Generators will eventually charge lower rates, although, as in Maine, they still are unlikely to be cheap. But if you ask FERC to exercise more authority over your market today, how will you ensure that FERC does not exercise unwanted authority over your markets tomorrow. If you call for FERC to set prices today, how do you know that at some point in the future FERC will not set prices, or at least some components of that price, at a level that Californians will almost universally agree is too high? And, finally, if your answer is going to be that only FERC has jurisdiction to act on these issues and questions, are you recommending that we change the allocation of authority between State and Federal regulators?

Mr. DAVIS. Well, I appreciate your comments, Senator, about the flip side of asking for assistance. FERC has been such an omnipresent factor in our market, ever since I became governor, that I never contemplated a day without FERC, even though it is probably worth a few minutes' contemplation.

I do want to make one comment. You touched on it, Senator Lieberman touched on it. Electricity deregulation might work efficiently if there is more power than demand. That is the key. And to States considering electricity deregulation, I would discourage them from doing so unless they first acquire more power than demand, because otherwise you are at the mercy of market forces that will extract every dime FERC allows them to from your citizens.

I think it is fair to say, Senator, if you were in my shoes and facing the extraordinary price increases that our citizens have, you would feel, as I do, that our first obligation is to fight back and try and get some relief from those price increases and assure people that the markets will stabilize and that henceforward they will not be subject to these rapid price spikes.

So, yes, I am asking for assistance. What we got on Monday was not perfect but is a step in the right direction. And I am hoping that this Committee will ensure that refunds are forthcoming. I think that will have a very sobering influence on the behavior of energy generators in the future. I want them to make money, I want them to be profitable, but not at the expense of driving our economy into a recession, which will have an adverse consequence on the American economy.

Chairman LIEBERMAN. Thank you, Senator Collins. Senator Torricelli.

OPENING STATEMENT OF SENATOR TORRICELLI

Senator TORRICELLI. Thank you, Mr. Chairman.

Governor, welcome to the Committee. Governor, I do not know that it is productive to engage in partisan blame in this matter. People in California simply want this problem solved. But I do have a sense of what is fair. Some things have been said about you and your administration that simply do not bear scrutiny. But the fact is your predecessor did not build power plants. You are building or planning 28. You claim that that is more than your predecessors or more than at any time in California history. You suffer from unnecessary modesty. That is not simply more than at any time in California history. That is more power plants ever built by

any State at any time in any comparable period. And the record should reflect it.

It has been said, indeed, that conservation should be part of this equation. Indeed, at no time in American history has demand fallen by comparable levels. California is not simply now exercising conservation. You have the most efficient use of electricity of any State in the Nation. Indeed, if the State of Maine were to become the model, every citizen of California would have to double their consumption next month to follow the Maine model.

On the question of whether or not there is responsibility for the current flawed deregulation plan, it should be noted that you did not write it, you did not design it, you did not vote for it, and you did not sign it. You just inherited it. And now you are fixing it, and that is to your credit.

Now, I do not think that matters to people of California. They just want this solved. But fair, nevertheless, is fair. And I think you have handled this very well.

Now, second, let me say something to the people on the FERC board. This Senate in confirming Presidential nominations looks to integrity and it looks to competence. Speaking only for myself, I want to make clear for FERC members who come before this Senate again, I am going to look for something else: Whether in this moment of crisis for the people of California they were responsive.

FERC has been late. Its response has been inadequate. I am glad they have acted. But unless or until this response carries the State of California through this building program until you have adequate supply, their response is not adequate. And I hope every member of the board who intends to return to this U.S. Senate listens very carefully to those words. This is now a Democratic majority Senate. It will remain so for some years, and we are watching how the people of California are treated, and we are watching very closely.

Third, let me say there are those who, I think, are genuine in wanting to help your administration. But there is a partisan overlay that perhaps separates the fate of California from what is happening with the rest of the country. That might be true with some States. It is not true with your State. If the economy of the State of California suffers, this country will follow. There is no separating your economic performance from that of the Nation as a whole. Everybody has a stake in how this evolves and whether or not this is solved properly.

Then, finally, let me add to you it is my observation that if this Committee were meeting on the price of corn or cotton or housing prices and we were witnessing falling demand, increased supply, and a 700-percent increase in prices, we would not be citing the laws of economics.

We would be citing the criminal laws, because it is against the law. There is a prima facie case that there must be some collusion. Prices are being set. The free market is not working. And this is one of the greatest examples I have ever seen in the history of our country, watching what is happening with these projections.

I, simply for my part, because you have answered so many of these questions, wanted to offer my compliments and to say that there is a public perception because of the national debate, that

some people are talking only about increasing supply, other people are talking only about the controls of pricing and what we are doing about consumption. Indeed, you have set records in both directions: The greatest reductions in consumption with the greatest conservation and the largest building program in American history for supply. Everybody else may have run to their extremes. It appears to me, you, if you alone, have struck a balanced program.

I hope the people of California in this difficult moment have the patience to see this through. There clearly is an answer on the horizon. And I hope, also, Members of this Committee and the administration will realize that those numbers of \$60 billion for consumption, what is behind those numbers. Every rise in that cost represents a family that cannot meet a mortgage, cannot educate a child, is taking from their retirement income to pay electricity bills. These are not some abstract numbers. It is people's quality of life and the future of their children that are being impacted.

And so when we talk about rebates from these energy producers, when we talk about the need to control their prices, this is not vengeance against some unnamed corporate entity. It is preserving the quality of life of individual families in California who are paying with their futures and their children's futures by this unconscionable taking advantage of this situation.

So, governor, I am glad you are here. You may have noted there is not a question in there, but, nevertheless, I thought there were some things that you might have been unwilling to say on your own behalf that needed to be said. I suspect I have no time, but if I do, it is yours. Thank you.

Chairman LIEBERMAN. I was going to advise you, governor, that after Senator Torricelli's statement, you could rest your case. [Laughter.]

Mr. DAVIS. Thank you, Senator.

Chairman LIEBERMAN. Thanks, Senator Torricelli.

And now, Senator Bennett.

OPENING STATEMENT OF SENATOR BENNETT

Senator BENNETT. Thank you. Don't get too comfortable. [Laughter.]

I lived in California for 12 years. I was there while you were Chief of Staff to Governor Brown and I welcome you to the Committee now.

I am delighted to have you say that President Bush did not cause this. I would hope you advise your political consultant of that fact. I will just leave it at that, but you saw the piece in the *Wall Street Journal*, as did I, as to how your political consultant tries to write economic policy by focus groups. I hope you will tell him, and then through him the people of California, that President Bush did not cause this.

Now, having said that, let me note that by virtue of what you have done, you have effectively nationalized the power industry in California. If California were a separate country, you have taken action similar to action taken by the parliament in Great Britain when the Socialist Party, the Labor Party, took it over, and have started doing things yourself as the chief executive of California which previously were done by private entities. You are entering

into long-term contracts on behalf of the State, taking out of the hands of the private entities the right to make those kinds of price decisions.

Let me review, therefore, the record from California with respect to your administration's ability to do this. I do this as a cautionary note. I have a quotation here from the *Wall Street Journal*. That is seen as a right-wing newspaper, so I will stay with newspapers in California and the comments that they have made about your stewardship in this area as you now step up with a nationalized program.

This is from the *San Francisco Chronicle*, not known as a right-wing newspaper. This is last February. "Governor Gray Davis was slow to respond to the economic realities of California's power crisis despite warning signals from legislators, regulators, and utility executives stretching back to last summer. Indeed, documents and interviews with industry insiders, regulators, and lawmakers show Davis may have contributed to the meltdown of the State's two largest electric utilities by neglecting a repeatedly suggested strategy for stabilizing wholesale prices."

"In addition, a top former Federal regulator said he told the governor's advisors and State Public Utility Commission officials as early as July that a key Davis proposal, to lower wholesale price caps, wasn't likely to solve the State's power problems. 'The Governor resorted to a log-rolling strategy to get us to do things that we understood at the outset were not going to be real solutions,' said James Hocker, an appointee of President Clinton's, who stepped down in January as the Chairman of the Federal Energy Regulatory Commission."

Now, moving to March and to the *Sacramento Bee*, Dan Walters, "Crisis Also One of Leadership." I will not quote all of it, but he says, "It is evident that it would have been a relatively minor bump in the road had Davis not frozen last summer when the first indications of price spikes arose. Had Davis done what private utilities, power suppliers, and others urged him to do then, adjust power rates slightly and allow utilities to sign long-term contracts with energy brokers and generators, the major crisis could have been averted."

Now, going to a source outside of California but one of the leading left-wing newspapers in this country, *The Washington Post* yesterday says, and I quote—

Chairman LIEBERMAN. We will note that the laughter was coming from the media table. [Laughter.]

Senator BENNETT. Well, if I am going to refer to the *Wall Street Journal* as a right-wing newspaper, I have to be even-handed and refer to *The Washington Post* as a left-wing newspaper.

Quoting from *The Washington Post*, "The Senate will hold hearings on California tomorrow." This appeared yesterday. "Governor Gray Davis, having won the argument on price caps, plans to use that occasion to demand billions of dollars in refunds from generators for the period when price caps were not in place. This is not a smart way to persuade generating companies to invest in new power plants in California, and without investment, blackouts will return to California sooner or later."

Now, as I said, governor, you have nationalized the industry in California. You have just entered into a contract for 8 years with Constellation Energy Group that would put a peak of \$154 per megawatt and off-peak of \$58 per megawatt. That is the decision you have made. The State has entered into that contract.

I would point out that Enron, who has come in for a good degree of criticism in California politically, last summer with the utilities offered them 5 years at \$50 per megawatt. You have just entered into a contract that is worse than the one that could have been obtained a year ago on the free market, and that raises questions in my mind about your ability to handle the nationalization of energy in the State of California.

I am assuming we will have a second round, Mr. Chairman, so I have laid the predicate for where I am on this first round, and either now or during the second round, we can get the governor to respond, because I do not want to unfairly put him in a position where he cannot respond. But I think the actions California has taken here are unprecedented, and in the second round, I will quote the assumption about those actions that are in both the *Los Angeles Times* and the *Wall Street Journal* and I think we ought to explore that very carefully.

Chairman LIEBERMAN. Senator Bennett, it had been my desire that there not be a second round, but if the Members want it, we will have a brief one, only because we have two other governors and the Attorney General and the Public Utilities Commission and the five members of FERC. But I wonder, Governor Davis, if you want to take a moment to respond to the statements that Senator Bennett has made.

Mr. DAVIS. Yes, Senator. I mean, I readily acknowledge I have a number of critics and you have quoted some of them. I do want to pick up on a couple other things you have mentioned. I have given President Bush credit for expediting Federal approvals that have allowed us to license 16 plants. I thank him for the extension of a couple emergency orders at the beginning of his term, and I believe in giving people credit when they do what I believe to be the right thing.

As to why the State stepped in in January of this year to buy power, it was very simple. These prices have brought PG&E to its knees. Edison was deemed uncreditworthy, and in a meeting here in Washington, the generators told me, we are not going to sell any more power to your utilities. So you either find us a creditworthy buyer or your lights are going out. The State decided to become a creditworthy buyer and has done our best to keep the lights on, the power flowing, and to spread out the Herculean rise in prices over a lengthy period of time, which ensures all the power costs are fully paid, but we don't shock our economy into recession, which I suggest would not do well for your economy or for the economy of this Nation.

If you want to get into the details, if there is a second round, I brought David Freeman with me. He oversaw the contracting process and is more familiar with it than I. But I have total confidence in his work. He ran the New York Power Authority. He ran the Tennessee Valley Authority. He ran SMUD. He ran the Department of Water and Power. Some people think he can't keep a job,

but he has actually done a good job in all those places and he had to negotiate with these energy companies starting in late January when we had no leverage, prices were running \$1,500, \$1,600, and \$1,700 for a megawatt of power, and I think he did a good job, not just in getting a good price for the State over 5- and 10-year period, but in shrinking the spot market, without which we would have seen higher prices than we are currently seeing this summer in our purchase on the spot market, because we have shrunk it to the point, through long-term contracts, where the price has started to come down.

Chairman LIEBERMAN. Thank you. Senator Carper, you are next.

OPENING STATEMENT OF SENATOR CARPER

Senator CARPER. Thanks, Mr. Chairman.

I want to say to my old colleague, Governor Davis, it is great to see you and I warmly welcome you to this place.

When I was running for the U.S. Senate a year or so ago, I asked a sitting Senator who had been a governor, what is the difference between being a governor and U.S. Senator, he used a football analogy. He said, when you are the governor, you are the quarterback on the field calling every play. When you are the U.S. Senator, you are the athletic director sitting in a box watching the game.

It is easy for us to sit here in the box watching the game to be critical of you and the other quarterbacks calling the plays and trying to move the team down the field. Senator Torricelli has already spoken, and I think eloquently, about your efforts, and I would just say to my colleagues, we could find pundits in our own States and throughout the country who would question our votes and our steps and missteps just as questions have been raised about some of the actions of Governor Davis. I applaud the efforts that you have undertaken and hope for you and for the people of California that the end will be a good one and a satisfactory one.

I want to ask you, if I may, to take the lessons that you have learned in California with respect to electricity deregulation and with energy conservation and to share with us what applicability there is for the rest of the country for our national policy, particularly with energy conservation. What are the lessons for us as a Nation derived from your experiences in California for electricity deregulation and for energy conservation?

Mr. DAVIS. In terms—I shared earlier one of my thoughts about electricity deregulation. States who have not yet decided to go down that road, in my judgment, should not do so until they acquire more power than their project demand. That will then give them leverage and allow them to say no to prices that are unduly high. We look forward to being there someday, so when someone offers us power at \$400 or \$500 or \$600 a megawatt hour, we can say, well, we will just turn on one of our peakers, or thank you very much, if you want to offer it to us for less than \$100, we will talk to you, and you have the leverage, they know you have the leverage, and you come to a reasonable resolution of that issue.

On conservation, this has been very exciting because it is something we had to do. It is not a question of whether we wanted to do it, it is a question of necessity for us to improve upon the con-

ervation gains that had been built into the system before I got there, and it is just exciting to see what people are willing to do.

When the President was in town, before my meeting, we met with technology companies. One company is making a flat-screen computer which reduces electricity usage by 75 percent. Intel is making a new chip that makes your computer much more efficient on "sleep mode," so it can receive information and still conserve about 60 percent of electricity.

We just tell people in their daily lives, if you are not in a room and no one else is in the room, turn out the lights. Turn up the thermostat two or three degrees. I believe in personal example. My wife has taken this cause of conservation to new heights. When you come into my house at night, it is like entering a tomb. There is no light, none, except a little crack of light under whatever door in the room she is in, and she has replaced all the lights with fluorescent lights. In the winter, the temperature was down to 55 degrees, so it was—I went to bed with a sweatshirt on. But her bill the first month was down 36 percent, last month, 63 percent.

So it is amazing what you can do if you are determined to reduce electricity, plus it is exciting to see some of the technology gains that will be on-line, not just for us but for the rest of the country, because no matter how much excess power you have today, you will get to a point when you don't have it and you will want the benefit of these technology improvements, which our crisis is forcing us to develop, and obviously, we will share them with everyone.

Senator CARPER. You mentioned, in fact, you described here and earlier the actions that the FERC announced on Monday as a step in the right direction. What might be some appropriate further steps in the right direction, one, for the FERC, and two, for us in the Congress?

Mr. DAVIS. Well, I think they have to look closely at there is still some potential for manipulation. Everything is geared to the least-efficient unit in the State. Everything keys off that.

Chairman LIEBERMAN. Governor, can I interrupt you? Congresswoman Susan Davis was here from San Diego and I know she has to leave now. Before she leaves, I want to note her presence for the record. Thank you for being here.

Mr. DAVIS. Thank you very much for being here. Thank you so much for staying. I lost my thought—

Senator CARPER. We were talking about steps in the right direction, appropriate next steps, one, by the FERC, two, by us in the Congress.

Mr. DAVIS. We believe what FERC has done will offer us some price relief. I notice that Mr. Hébert was suggesting that the order that he implemented on May 29 was responsible for some falling prices in California, and it may well have been for 2 days, the 30th and 31st. But we haven't had a stage one alert since then, so that order only affected us 2 of the 22 days it has been in effect. So now, by making it applicable across the board during any purchases, real-time purchases of power, it should have a downward impact on prices.

I don't know all the potential for manipulation, but the people in the energy business are smart folks. They have got trading floors that compare favorably with the New York Stock Exchange. They

have teams of meteorologists. They have media operations that would shame a network, and so I am sure they will do their best to find whatever loopholes are there and we need to be vigilant. This Committee needs to be vigilant, and so does FERC, to make sure that the thrust of its order is, in fact, carried out and the relief that is intended is made available to us and, hopefully, to the rest of—in terms of refunds, to the rest of the West.

Senator CARPER. The last half of my question. What appropriate steps are in line for the Congress? What should we be doing? Should we simply be monitoring the actions of the FERC, holding hearings like this, conducting oversight operations?

Mr. DAVIS. There are many things that obviously compete for your attention. I tried not to give you too long a laundry list. I mentioned two. The President, when we met with him, and again, I thank him for the meeting. Even though we didn't agree on price caps, we agreed on this. There was no reason that the price of natural gas should be significantly higher in California than in the rest of the country, particularly natural gas coming from Texas, and he was open to the possibility, because I ran this by him twice and he said, "Yes, you can say this," he is open to the possibility that the tariff should be reimposed on the transportation quotient of natural gas. Natural gas is deregulated, but there used to be a fixed price you could charge for transporting it. That is one possibility to reexamine.

So the two things that I would suggest this Committee focus on in terms of its dealings with FERC are the potential for manipulation on the natural gas issue, because natural gas is not only a cost in and of itself but a huge part of electricity costs, and what I think is the necessity is providing refunds to Californians and other citizens in this State who have been unduly victimized by extraordinary electricity prices.

Senator CARPER. Again, welcome. Thanks.

Mr. DAVIS. Thank you. It is a pleasure to see you in your new capacity.

Senator CARPER. Thank you.

Chairman LIEBERMAN. Thanks, Senator Carper.

Next, we will go to Senator Voinovich.

OPENING STATEMENT OF SENATOR VOINOVICH

Senator VOINOVICH. Welcome. I was just thinking that nobody knows the trouble a governor has unless they have worn the shoes of that governor. I went through the minefields of deregulation while I was governor of the State of Ohio. The deregulation legislation finally went into effect a year after I left.

I have looked at your deregulation and I think that it ought to be revisited, and I think that some of us that came in afterwards learned some lessons from California.

Last week, we had five outstanding economists come here to speak before us and the question to them was, do we need a legislative solution to the problems that you are dealing with in California. Their answer was, no, FERC already has authority to handle the situation, although they did admit that FERC has been slow to take on new responsibilities that have come with deregula-

tion, and that they probably needed some more people and expertise.

As you know, FERC has recently adopted a system of price controls that allow for all generating units that provide energy to California to recover their costs plus a reasonable profit. That is what we did in Ohio. We created a restructured electric utility system that recovered stranded costs while also allowing for a reasonable profit for generators. That, in turn, encouraged greater investment in new generation. In fact, by 2007, governor, we are going to have 18,000 new megawatts of on-line power because we had a 5-year cap, but it took into consideration that companies have to make a profit and recover their costs. I think that FERC's decision this last week is going to provide some short-term relief for you. But I do not think there is any quick fix.

The point I am making is that price caps will not solve supply shortages in California. In fact, price caps that are set too low discourage investment, as you know. I think Robert Samuelson noted in the *Washington Post* last Wednesday that the root cause of your problem is demand outran supply, and for California to avoid the constant worry over the ability to provide power, investment in new power generation has to be encouraged, including the implementation of a streamlined siting process that protects public health and the environment, and I think that you perhaps ought to look at your deregulation law again.

Other States, and this is something that is really significant, have worked through deregulation issues on a cooperative regional basis. By contrast, the California situation seems to be extremely polarized, with California insisting that Western States take definitive positions for or against price caps.

The question is, at what point will California be willing to become part of a regional solution, as called for by FERC, rather than insisting on its own independent governance structures to run the electric grid? Instead of a single State operator of the transmission grid, I think the opportunity exists for a regional transmission organization to be established, just as we did in the Midwest when I was governor. We had a multi-State ISO. What do you think of going to a more regional approach instead of your current handling?

Mr. DAVIS. As you know, the next largest State in America, Texas, is not under FERC jurisdiction because they have not yet separated generation from distribution. The next two States, Florida and Texas, have submitted to the FERC permission to be their own ISOs because of the size of their economies. Because we are the fifth—at least last year, we are the fifth largest economy on the planet, I think at least for the foreseeable future, we should be our own ISO, as well. Now, I certainly believe that until we get to a situation where we have more power than demand.

This has been, as I am sure you can tell, being a former governor, one of my least favorite things to do, occupying a great deal of my time, and I think it is just imperative that we stay the course on building new power plants, on conservation. I am pleased that there is some response from FERC on price relief prospectively. I am hoping that with your assistance, there will be response on price relief retroactively.

So I would not be open to the State joining a regional ISO—I would not be open at all until we reach the point where we got to 15 percent more supply than demand. Then I would be willing to revisit it.

That is not to say I don't have great respect for our neighbors in the West. We have a particularly friendly relationship with the neighbors that border us, be it Arizona or Nevada or Oregon and also with Washington, and a sharing relationship with our neighbors to the Northwest.

Senator VOINOVICH. Being next to California is like being in bed with an elephant, and you have had a dramatic impact on your regional area. Ohio is the third-largest user of electricity in the United States of America. We had a regional ISO and we have found it to be beneficial. I would suggest, governor, that you look at that. I know FERC has recommended that. I would appreciate, as a member of this Committee, that you seriously review that issue again and I would like to talk to you more about it.

Mr. DAVIS. As a courtesy to you, Senator, I will do that, and I would be pleased to have a discussion with you.

If I could just make this final point, until Monday, despite a year of effort on my part and all the agencies that I work with in California, we did not have a satisfactory response from FERC on any matter. As a matter of fact, we think their lifting our price cap in December 2000 was responsible for blackouts because there were no blackouts when we had a price cap in effect, none, and it was only when the price cap was lifted there became an incentive to withhold until the last minute. Gaming became a great prospect.

And while I quickly acknowledge that price caps on a long-term basis don't make economic sense, I also want to acknowledge that 12 of the 16 plants that we have licensed submitted their application when the hard price cap was in effect of \$250. So they must have thought that was sufficient, offered sufficient return on their investment. And in terms of conservation, there is nothing that will discourage us from improving upon our conservation because we have to do that to minimize the potential for blackouts and disruption.

So while theoretically I acknowledge that price caps do not—they may well discourage conservation and discourage investment, our experience in California, given the situation I have described, is to the contrary.

Senator VOINOVICH. I have learned in my life that when things go wrong, so often what we do is point to other people as being responsible for our problems. I have found that it is good to look to one's self and see if there are things that one can do to improve the situation, and I believe that is the attitude that you and your State should have and work with FERC and everyone else. But I think that the finger-pointing ought to end and we ought to figure out how to get this job done, because it is not only affecting your State, but the entire country, including my State.

Chairman LIEBERMAN. Thank you, Senator Voinovich. Senator Carnahan.

OPENING STATEMENT OF SENATOR CARNAHAN

Senator CARNAHAN. Thank you, Mr. Chairman.

Welcome, Governor Davis.

Mr. DAVIS. Thank you, Senator.

Senator CARNAHAN. I have appreciated the forthright manner in which you have responded today.

I realize that our topic is primarily the situation in California, but Missourians are very concerned about the energy picture, as well. They have watched the crisis unfold in California and they have been worried about their own energy bills and how they, too, have increased steadily.

It is important to focus on the proper role of Federal regulators as we restructure the electricity industry. As we consider future policies at the national and State level, we should learn from the problems of the past.

We are told that a fully-functioning deregulated market should lead to lower prices, and, of course, this is a very appealing argument. But for all of the initial optimism about lower prices, California's experiment with deregulation has caused me to question how future transitions should be managed. If the deregulation is to continue, we must have the structure in place for a successful transition. Public confidence is an important component of any successful market, but competitors must also feel that there is a level playing field and that markets are not designed in ways that unfairly benefit some players while creating barriers for others.

This brings us to FERC's role in the process. There is certainly no shortage of opinions on the merits of the order FERC announced last week. But the question in my mind is even more fundamental. What is the appropriate role for the Federal Government to play as more and more markets move from regulation to competition? Regardless of our views on the merits of FERC's order, the fact remains that FERC's action came long after the market was found to be dysfunctional, months after the rates were found to be unjust and unreasonable.

Like many other States, my home State of Missouri is considering deregulation. If Missouri deregulates, assuring just and reasonable rates for Missouri consumers will be entirely in the hands of FERC. FERC's performance in California does not inspire confidence.

This week, FERC finally began closing the door on rate gouging in California, but only after letting a \$50 billion horse out of the barn. Missourians deserve assurances that if our State deregulates, we won't be stampeded by runaway prices.

I am sure that leaders in California have spent countless hours considering what mistakes they have made in the past and what they can do in the future to improve the situation. Now, I would hope the Federal Government would conduct the same sort of analysis.

In April, Senator Lieberman and I wrote to the General Accounting Office asking that it conduct an independent review of a number of matters relating to FERC. Specifically, we requested that the GAO study whether FERC has fulfilled its mandate to ensure just and reasonable prices. FERC played a very different role when they were Federal caretakers over an often stodgy regulated industry. But I am coming to believe that a new approach will be required to oversee what has become a very dynamic industry.

FERC must seriously reexamine its role in light of recent experiences. This Committee must aid that effort. If we find that FERC is not living up to its mission, or if it simply cannot live up to this mission because of limited resources or other factors, we must determine the most effective and efficient remedy. Otherwise, I believe that a truly competitive market for electricity may well be a long time coming.

To instill public confidence in our energy markets, FERC must prove capable and willing to assert its authority by closely monitoring markets and better anticipating potential problems, and perhaps most importantly, it must be prepared to take swift corrective action when there is evidence of flawed markets or abuse of market power. This is a duty we owe to the American people.

I want to thank you for being here today. I admire your courage and your willingness to take on this very tough problem. I have just a couple of questions I would ask you at this time.

From your experience, do you believe that FERC is equipped to fulfill its responsibility to ensure just and reasonable prices as we transition from a regulated to a deregulated energy market?

Mr. DAVIS. I think the jury is still out on that. Clearly, we feel we have been denied relief, at least from November 2000 until Monday, and then the relief we have received is prospective in nature. The true test of their leadership on this issue and whether or not they are going to fulfill the mandate of the Federal Power Act will be seen on how they deal with the refund question. So I can't answer that question any more clearly.

I know it is customary for witnesses to sort of break down on partisan issues, but the commission did not take a positive step until the two Bush appointees joined it. I don't know if that means they will take a positive step on refunds or not. It remains to be seen. I hope they do.

Senator CARNAHAN. And one other question. Recently, we have seen some individual transactions where prices were abnormally high and some have argued that this has resulted from manipulation in the market and abuse of market power. Should FERC be more aggressive in its investigation of abnormal transactions to determine if market power, in fact, has been abused?

Mr. DAVIS. I think the answer to that is unequivocally yes, Senator. In our State, we have logs that indicate plants were shut down per marketing division. Now, in and of itself, that may not be conclusive, but you have to ask yourself why the marketing division would have an interest in telling a plant to shut down.

The maintenance of our plants, admittedly old ones, some 30 and 40 years old, averaged 3,000 megawatts in each of the years of 1999 and 2000, averaged about 11,000 to 15,000 megawatts the first 5 months of this year, and the figures I gave you before were a comparison, April through May of 2000. In 1999, it was about 3,000. This year, it started at 11,000 and went up to 15,000. I mean, we can't prove that they withheld power in order to drive up the price, but it does seem kind of odd that so many megawatts were out of service.

So I think that is at least one area that the FERC could be more aggressive in ensuring that the market is not manipulated and that consumers are not unduly charged with excessive prices.

Senator CARNAHAN. Thank you very much.

Mr. DAVIS. Thank you.

Chairman LIEBERMAN. Thanks, Senator Carnahan.

Senator Domenici

OPENING STATEMENT OF SENATOR DOMENICI

Senator DOMENICI. Thank you very much, Mr. Chairman.

Governor, it is good to be with you.

Mr. DAVIS. I, as well.

Senator DOMENICI. I want to just talk about one area that concerns me, and I have difficulty understanding what happened and why it happened, and that has to do with the absence of long-term contracts during most of this crisis. I have tried my best to go through a chronology of events with dates and I have been able to come up with 11 opportunities at different times. Starting in mid-June 2000, there are 11 times when a U.S. governor was either offered the opportunity to enter into long-term contracts or you were urged by some committee or group that was advising you about the problem, where long-term contracts were recommended but that recommendation went unheeded. So let me go through a few and you tell us what happened.

In mid-June 2000, Southern Cal met with you, according to what we have here, and the top advisors, and they warned that electric prices in San Diego could soon go sky high and that his company would have to take on significant debt. I understand at that opportunity, at that event, the suggestion was that long-term contracts be entered into. If that is the case, why was that ignored at that time?

Mr. DAVIS. I would like to ask if I might bring David Freeman with me, who helped negotiate some of these long-term contracts. Could I ask him to come forward?

Chairman LIEBERMAN. Sure. Mr. Freeman, why don't you come up, take the seat next to Governor Davis, and just identify yourself for the record. Don't tell us all you have done in your life because we do not have enough time.

Mr. FREEMAN. I am Dave Freeman and I am the senior energy advisor to the governor, I think I am the oldest guy around.

Chairman LIEBERMAN. That is a good sign.

Senator DOMENICI. The oldest guy around, where, in California or up here?

Mr. FREEMAN. Both. [Laughter.]

Senator DOMENICI. Let me say to you, as the advisor, I prefer to ask these questions of the governor, but if he needs help from you, that is fine with me. I understand that.

Mr. DAVIS. I understand that.

Senator DOMENICI. Let me take two or three of them and then you can answer together. I just gave you one, mid-June, Southern Cal meets with the governor—I assume you are aware of this meeting—and the recommendation was that prices were going to go sky high in the San Diego area and that that company was going to have to take on significant debt. On that occasion, the idea of long-term contracts was broached, entered into, and nothing was done about it.

Mr. DAVIS. I can answer that question. That was before the State got into the business of buying power in early January 2001. The PUC did give approval to the three utilities to enter into long-term contracting. The PUC insisted that it keep its prudence review, which only makes sense because a utility could enter into a contract for 3,000 or 4,000 megawatts an hour and then the consumer would be obligated to pay that.

Some of the utilities took advantage of those long-term contracting opportunities, others didn't, but the PUC did act, I believe, in August to allow all three utilities to enter into long-term contracts.

Senator DOMENICI. OK. Well, let me move—

Mr. FREEMAN. Senator, that is correct, and they just didn't.

Senator DOMENICI. Please?

Mr. FREEMAN. I think the utilities who were then purchasing their own power just failed to enter into long-term contracts. If they were here, they would say that they weren't sure that the PUC would approve them, but they did not try.

Senator DOMENICI. Well, let me go on to a couple of other dates and tie two dates together. July 21, 2000, PG&E files an emergency motion seeking authority and guidelines to sign long-term contracts with electricity suppliers.

On July 27, the governor calls on FERC to extend wholesale electric price caps. Now, it seems to me he must not have been supporting long-term contracts at that point and I want to know—

Mr. FREEMAN. No, sir. The two actions—

Senator DOMENICI [continuing]. Were they not good?

Mr. FREEMAN [continuing]. Are not inconsistent at all.

Senator DOMENICI. Is there something wrong with long-term contracts?

Mr. FREEMAN. No, sir. The two actions are not inconsistent at all. The price caps were to control a runaway spot market that was literally taking the money out of the pockets of the people of California. The long-term contracts were designed for the future, to establish a just and reasonable market rate. But the caps were needed not to control long-term contracts—

Senator DOMENICI. No, I know that.

Mr. FREEMAN [continuing]. But to control the spot market. So the two actions were completely consistent.

Senator DOMENICI. I understand they are different, but it seems to me that I have ten instances when the governor had a chance to support long-term contracts and didn't. On a number of occasions, instead of doing that, shortly around that time, he suggested caps. It seems to me that is what he wanted all along, was just caps. That was his proposal.

Mr. DAVIS. Senator, the Public Utilities Commission met in August and granted all three utilities the right to enter into long-term contracts. Some utilities took advantage of that, some didn't. As David Freeman correctly points out, they will complain that they had to be subjected to a prudence review, but every PUC commission in the history of our State that has granted long-term contracts has always insisted on an opportunity to review the prudence of that contract for the reasons I suggested earlier.

So we did—I can't just say, you have long-term contracts. That is not within my power. The Public Utilities Commission, then consisting of three members appointed by Governor Wilson and two by me, did agree to grant that permission in August, the month after the question arose.

Mr. FREEMAN. Senator, if I could just add, the minute that this governor had the authority to enter into long-term contracts, that is when we started doing it, almost the very day, in fact, a few days before the statute was actually enacted by the legislature. It wasn't until January 2001 that the State began buying power. Before that, it was the utility's responsibility and the dates that you are mentioning are all before Governor Davis and the State got into that business. But the minute we did, we negotiated \$42 billion worth of long-term contracts in several weeks, the largest exercise of that kind in the history of this country.

Senator DOMENICI. Well, let me just generalize and then ask two more questions. Are you suggesting here before our Committee that you, governor, and if you are his advisor, you can answer that, you promoted and encouraged and wherever you had authority, you actually pursued long-term contracts during all of this crisis? Were you not at some point against entering into long-term contracts?

Mr. DAVIS. No. There are two separate periods in question. First is a period when the utilities were buying power, and was a period when we were buying power. We started buying power January 18, 2001. I asked David to start buying power, was it before the month was out?

Mr. FREEMAN. Yes, sir. It was——

Mr. DAVIS. We asked within a matter of days after the State started buying, and net short, for the State to secure long-term contracts because we wanted to wean ourselves from total dependency on the spot market.

Now, the earlier phase, when the utilities were buying power, at various points, they did raise to me the issue of long-term contracts, something, I might add, that FERC discouraged in 1995, 1996, and 1997. I advised the Public Utilities Commission, in my judgment, it made sense—they had to schedule the meeting, they have 30 days' notice, they gave permission in August 2000. I think two of the three utilities took advantage of that opportunity to obtain some long-term contracts, but all three were given permission to do it.

Senator DOMENICI. If you have another chance, I will ask another question.

Chairman LIEBERMAN. Yes. Thanks, Senator Domenici.

Governor, some of my colleagues on the Committee have asked for a second round, and because of the importance of the issue, notwithstanding that we have a couple of governors, attorney general, etc., waiting, I am going to go ahead and do that. I am going to ask my colleagues to stick to 5 minutes.

I do want to ask you, would you like to take a brief break?

Mr. DAVIS. If I could take a 5-minute break, I would appreciate it.

Chairman LIEBERMAN. This reminds me. Once before, a few years ago, I was going to meet with President Assad of Syria and probably the most significant advice I got, excuse my explicitness,

was to go to the restroom before the meeting because I could expect it to go on for a long time. This apparently is also true of testifying before a Senate Committee. So we will take a 5-minute break.

[Recess.]

Chairman LIEBERMAN. Let us reconvene. I am sure not just Governor Davis, but all of us benefitted from the break and an opportunity to stretch our legs a bit. I thank you very much. It has been a very productive and interesting morning.

I want to say to my colleagues, though we are going to go to a second round, I hope everyone knows they do not have a constitutional or legal obligation to ask questions on this round.

Senator BENNETT. Yes, we do. [Laughter.]

Chairman LIEBERMAN. I will now call on Senator Thompson.

Chairman THOMPSON. Thank you very much. Governor Davis, I think that one of the increasing concerns that we all have is whether or not these plants that may be in the process of being licensed are actually going to get built. There are several who have expressed reservations about investing in new generation in California.

Merit, for example, a spokesman said that—well, this is from the *San Francisco Chronicle*, June 2, 2001. An Atlanta company that just got approval to build a power plant in Antioch is holding off construction, citing California's push for Federal price controls and rhetoric about possible seizures of power plants. The *Charlotte Observer*, April 27 of this year, says even though Duke Energy Corporation is building one, the Power Star, of California's biggest power plants, top executive Rick Prowery said the company would hesitate to build more California plants because the State's energy economy resembles that of a third world. Reliance expressed some similar concerns. "Ridgewood Power said generators find it more predictable and less risky to operate in third world companies than they do in the State of California," griped Marty Quinn, Executive Vice President and Chief Operating Officer.

Of course, obviously, some of these folks have their own axes to grind. There is no question about that. But we have also heard from investment bankers, as I indicated earlier, about this. You can't get away from comparing that with the rhetoric that has come out of California. These power suppliers have been subjected to all manner of description. You have an Attorney General there who apparently wants to introduce the head of Enron to your President so that he can be introduced to a fellow named Spike.

Assuming that these energy executives don't want to meet Spike, I wonder what that is doing to the atmosphere when you are going to threaten to seize plants. What is that doing to the atmosphere when you are going to have to be, I think, in the future—we are talking about short-term solutions here right now primarily. You are going to have to be dependent upon substantial new investment at a time when the regulatory environment is very uncertain for these people to start with, and now they are finding a very hostile political environment. Is that a wise strategy at this time? Are you concerned about the completion of plants and suppliers who are expressing these serious reservations?

Mr. DAVIS. Well, Senator, with all due respect, the people I represent are mad. They don't like paying 700 percent more for elec-

tricity. Small businesses in San Diego don't exist anymore because they had to face this problem in the year 2000 and they want us to fight back, and that is what we are doing.

This is a rough business. You know these energy companies. Many of them have a wildcatter mentality. My grandfather had something to do with the oil business and I know what that attitude is like. California has been a cash cow to a lot of energy companies around this country who have done extraordinarily well, and occasionally some harsh words get exchanged. But my job is to fight back and say we are not going to take it, and I suggest to you, if it were not for a good deal of what you might consider political hyperbole, we might not have the attention of the Federal Energy Regulatory Commission that stiffed us for almost a year.

Chairman THOMPSON. Do you think that FERC responded to your Attorney General suggesting that the head of Enron be thrown in jail with Spike, or do you think FERC responded because you called the suppliers pirates and words of that nature? It may make you feel better, and it may be understandable in responding to your constituency. We all have the temptation to do that from time to time. You are not alone in that respect. The only difference here is, you are going to be very dependent on these same people.

Regardless of the past, it looks to me like you have to look to the future. Is it the responsible thing to do to create an environment for the very people who are in the process of looking at California for future investment, and sometimes have requested license applications, who are now doubtful because of the regulatory and the political environment in your State when you are the head of that State?

Mr. DAVIS. Well, first of all, as Senator Torricelli pointed out, we are building more power plants than anyone has ever built.

Chairman THOMPSON. How much has come on-line in the last 2 years?

Mr. DAVIS. It takes about 2 years to build a plant, but as I said in my initial comments, there will be three plants on-line between now and July 7, representing about 1,200 megawatts. There will be ten peakers representing about 800 megawatts. And there will be a total, when you count distributive generation, additional renewables, re-rating power plants, approximately 4,000 megawatts by the end of September. We anticipate 5,000 megawatts for each of the 3 years following that for a total of 20,000 megawatts.

Now, obviously, we want the State to be an attractive place for investment, but we don't want companies walking all over our citizens. We want—responsibility is a two-way street. We understand the obligation to be responsible and we expect corporations that operate in our State to be responsible, and by and large, they are.

Chairman THOMPSON. Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thanks, Senator Thompson. Senator Bennett.

Senator BENNETT. Thank you. I want to go in the same direction, Governor, as Senator Thompson. Last time, you said I quoted your critics. This time, I will quote you, and it is interesting that Mr. Freeman is sitting next to you, because here is a circumstance where the two of you may have said different things.

Here is a quotation, a release from the Office of the Governor on May 31, 2001: "I met with the municipal utilities about 3 weeks and I was very disappointed to learn that they were charging us more for power than the generators. Here we have been maligning the generators, properly, because they have been selling us power at 600 to 700 percent what we paid for it just 2 years ago. I find out the munis are charging us even more. So I said, listen, you are going to sell us your excess power this summer at a cost-plus basis, roughly 10 to 15 percent over cost, or I am going to seize it from you and I am going to make sure that we get that power at an attractive rate."

"I gave them a couple of weeks to negotiate with the Department of Water and Resources. The first day they had to negotiate was this Tuesday. We will see what happens in 2 weeks, but if they don't come through with contracts, I am going to seize the power because they are creatures of the State legislature. They are supposed to provide power on a cost-of-service basis, not make a zillion dollars by charging more than these out-of-State generators who set the Guinness Book of Records for greed themselves. The munis are doing even more."

And then, Mr. Freeman, you are quoted in the *Los Angeles Times*, not specifically in response to the Governor's statement, but generally. "These charges go under the heading, 'There is no good deed that goes unpunished in this State,' Freeman said, noting that DWP Power helped avert more blackouts across the State. He did acknowledge, however, that the agency has charged high prices for surplus power at the 11th hour, but said that was only because it cost more to produce. 'We have consistently charged Cal ISO our cost-plus 15 percent,' he said. 'It is not as though we are up there peddling a bunch of power to jam it down their throats.'"

Now, my question—first, if you want to challenge the statements, that is fine, but my question is, you are here asking for refunds and rebates from those whom you say gouged and bilked Californians. Are you planning to ask of that from California munis?

Mr. DAVIS. I believe everybody that unduly took advantage of this situation should be required to make rebates. Californians expect people to treat us fairly. We expect to treat them fairly in return.

The statement you quoted from me was accurate. I was appalled to find out that these municipal power authorities, which were creatures of the legislature, we gave them permission to exist, because they were not supposed to be competing with the free market, they were supposed to provide cost-of-service power, had, in fact, charged us roughly \$360 a megawatt hour while the generators had charged us about \$310 a megawatt hour, and I found that out about 30 minutes before the meeting we had with the munis.

So my job is to protect all the citizens of this State from getting a raw deal and it doesn't matter to me if the raw deal comes from a generator from Houston or a municipal power authority in Los Angeles.

Senator BENNETT. Mr. Freeman, the governor has asked you to the table. Do you feel that you gouged the State while you were running the muni and charging cost-plus 15 percent?

Mr. FREEMAN. No, sir, and your researcher overlooked one relevant fact, which is that the day after I left the Department of Water and Power, that board of commissioners changed their policy to start charging market prices for power, and it was that market price policy that Governor Davis correctly was criticizing. They have since then backed off and they have now agreed to sell at cost. So the governor is entirely correct, but I think that I was accurate when I said that our policy when I was there was to sell at cost-plus 15 percent.

Senator BENNETT. Do you feel that—

Mr. FREEMAN. But if there is any investigation that shows that we charged more than that, the muni should refund the money just like anyone else and the governor is being consistent. Indeed, he should be congratulated for being just as hard on the municipalities in California as he is on the other generators. It seems to me that this is just more evidence that he is standing up for the consumers across the board.

Senator BENNETT. I appreciate that clarification. Just one last comment, Mr. Chairman, if I might.

Your \$50 to \$60 billion projected figure does not coincide with the earlier chart that Senator Murkowski put up that shows that prices are, in fact, coming down. I would appreciate it if you would supply information for the record as to whether or not you are prepared, after examining where prices are, to lower that projection or if you stand by it. We don't have the time to go through it here, but we have had two separate charts that show different projections for the future and I would appreciate whatever further clarification you could give to that.¹

Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thanks, Senator Bennett.

Just real briefly, I do want to quote with regard to the impact of price relief or price mitigation questions. Fair questions have been raised about the impact of that on the willingness of power producers to come into the California market. The *Los Angeles Times*, which I will not describe according to any particular ideological inclination, says today, headline, "Curbs Won't Halt Plants."

First paragraph, reports reporters Nancy Vogel and Thomas Muligan, "The expanded electricity price limits approved by Federal regulators could squeeze big energy traders but will probably not discourage power plant construction in California, electricity producers said Tuesday." "But the companies," I go on, skipping a paragraph, "the companies generally asserted Tuesday that the order would not deter them from investment in the vast power-starved Western region, though they have often raised such a prospect in arguing against price controls." So that is certainly an encouraging dispatch or independent report.

I think I am going to control myself and not ask any more questions because you have been on a long time.

Governor Davis, you have been tested generally in this crisis. You have been tested this morning. But by my judgment, you have passed the test very, very well. I appreciate your testimony and I appreciate not only the fact that you have become an expert in

¹Chart entitled "California Day-Ahead Power Prices," appears in the Appendix on page 551.

something you probably weren't an expert in a couple of years ago, but the tone in which you have spoken.

I think you were quite right. You said that neither you nor President Bush was there at the origin of this problem. The question is, what do we all do about it now, and that is the question that we are asking FERC. This is not a partisan matter, by any means. This is just a question of a genuine crisis, not of your making, not of the President's making, but so genuine that it threatens the economy. And I have noted now, California's economy is now the fifth largest, if it were a country, in the world, and it is critically important that we all do our share to overcome the crisis.

I think, as you have testified very directly and eloquently today, the State of California, the legislature of California, the people of California have done their part and FERC has finally come into the arena and done some things to be helpful. I have concerns, as I stated at the outset, about how fully effective it will be. I share your concern about the inequity of not ordering refunds to go to electricity customers in California and the West because they suffered damage here. When you have a right, as you said, without a remedy being offered, that undercuts our system of justice. And, it does not deter future behavior of that kind by energy wholesalers or anybody else who would take advantage of a consumer.

So we are going to ask that question of FERC this afternoon and we are going to stay on the case until we feel that we have done as much as we can by way of our oversight to make sure that the Federal Government plays an appropriate role here, or at least that we have adequate public discussion of the role that it is playing.

I thank you for the time you took in coming out here. You have contributed substantially to our understanding of the problem and I wish you well.

Mr. DAVIS. Thank you very much. Thank you, Senator Thompson.

Chairman LIEBERMAN. Thank you. We will now call the Hon. John Hoeven, Governor of the State of North Dakota, and the Hon. Judy Martz, Governor of the State of Montana.

According not just to the tradition but the rules of the Committee, we try to conduct these hearings and our deliberations generally in a bipartisan fashion. Senator Thompson requested that these two governors be called and I am delighted that you two have taken the time and made the effort to be here. Your presence obviously punctuates the fact that we have all been testifying to, that though California may have been most extremely impacted by this energy price and supply crisis, that certainly other States in the West, let alone States throughout the country, have an interest in this. So we look forward to your testimony.

Governor Martz, do you want to proceed first?

TESTIMONY OF HON. JUDY MARTZ,¹ GOVERNOR, STATE OF MONTANA

Ms. MARTZ. Sure. Thank you very much. Thank you, Mr. Chairman, and thank you, Senator Thompson and Members of this Committee. My name is Judy Martz and I am the Governor of the Big

¹The prepared statement of Ms. Martz appears in the Appendix on page 821.

Sky State of Montana. I appreciate the interest this Committee has shown in the struggles of Western States to deal with an electricity crisis. I may, as Vice Chairman Thompson said, rain on a parade.

We are here to discuss the role of the Federal Energy Regulatory Commission associated with the restructuring of energy industries. However, the real issue seems to be what went wrong in California and could it happen elsewhere? Let me try to answer this question.

The facts show that the primary responsibility for the electricity crisis in the West lies within the State of California. A series of mistakes made by the State and the failure by the State to take corrective action once problems first arose more than a year ago led directly to the crisis we are in now. This crisis, I believe, could have been avoided if California had taken timely action.

Instead of acting, I believe the State, unfortunately, engaged in a prolonged exercise of blame shifting. I don't say this to be disagreeable. I really don't. I say this from the perspective of a State that has been hurt by the California electricity crisis. I also say this to make sure that other States do not make the same series of mistakes California made in the recent years.

We all want to do our share, but it is killing us. Montana has been hit hard by the very same issues that Washington State has. As a result of the California electricity crisis, Montana industrials have gambled on declining future power prices that have been hurting us as a result of the power prices rising. We have seen several closures in Montana, a State whose economic base cannot afford to lose even one single job.

But because we are tied to the Western grid, any excess energy is pooled to other States and we face higher rates ourselves. Industries that chose to shop for energy found their traditionally low rates of about \$30 per megawatt rise to as high as \$300. Much of the pain that my State and others have felt could have been avoided if California had not shied away from making tough decisions when they were called upon last year.

Let us review how we got here today. California was the first State to open its retail electricity markets to competitive markets in 1996, with Pennsylvania following quickly on its heels. The California electricity law is often described as deregulation, but it was nothing of the kind. California did not deregulate electricity markets but merely exchanged one set of State regulatory rules for another, which led to disaster. We did better than that in Montana.

The 1996 law had a number of unusual elements. It forced California utilities to divest much of their electricity generation. It required utilities to rely completely on volatile spot markets to buy all of their power, something no other State did. It also imposed regulatory rules governing spot market sales that increased wholesale market prices. It froze retail rates.

One provision missing from the 1996 law was reform of the State siting law. It can take up to 7 years to build a power plant in California, and on the average period, it is 4.5 years, nearly twice the average as in Texas. This was a crucial mistake. Since California retained a siting process suitable for long-term planning by regulated utilities with 10- or 20-year planning horizons, but completely unsuitable for a competitive market where independent power pro-

ducers build virtually all power plants using much shorter planning horizons.

The failure to address siting reform was, I believe, a major mistake. Independent power producers moved quickly to meet California's growing electricity demands, filing applications to build 14,000 megawatts of new generation beginning in 1997. Because of the failed State siting process, none of these power plants are operating yet. Montana did not make that same mistake. We revised our siting laws to exempt generation facilities.

It is important to note that the supply shortage in California did not occur overnight. It developed over a 5-year period when electricity demand rose by 6,300 megawatts. Incredibly, over this same period, electric generating capacity in California actually declined. As I indicated earlier, California took a big gamble by forcing its utilities to buy all their power through a volatile spot market. It took an even bigger gamble by not ensuring that electricity supplies were adequate to meet the needs of consumers and businesses. It doesn't take a panel of economists to know that supply shortages and spot markets are not a good combination. They produce the sky-high prices that California and the West have been paying now for the past year.

California has had price caps for the wholesale power sale since 1998. Last year, California experimented with four different price caps, starting with a hard cap of \$750 per megawatt hour. This year, FERC changed tactics, approving price mitigation that reflects gas costs and other costs. That approach seems to be working, and FERC earlier this week expanded the scope of its price mitigation plan.

Price caps exacerbated California's supply problems last year. Since the caps did not apply to the Western markets and State power producers often chose to sell electricity outside of California at prices higher than the hard cap, as a result, power exports from California rose 85 percent and California's electricity supply fell by 3,000 megawatts. By the end of the year, when the hard cap had been lowered to \$250, the price cap was seriously exacerbating California's electricity supply problem, since prices in an uncapped market had risen to more than \$400. Ultimately, California had to ask to lift the price caps on the grounds that it was causing serious supply problems.

On December 8, 2000, the California ISO filed an emergency petition to waive the \$250 hard cap, which FERC approved. At their request, FERC set a soft cap. Price caps last year did not control high prices. Each time prices were lowered, average monthly prices rose. The experience last year showed that price caps failed to control high prices and exacerbated supply problems.

The lessons California apparently drew from the failure of price caps last year was to expand the scope of price caps to encompass the entire West, notwithstanding the opposition expressed by eight of the 11 governors in the region, and I repeat that. Eight of the 11 governors in the region opposed price caps.

The main cause of the California electricity crisis is a supply and transmission shortage. It is each State's responsibility, not the Federal Government, each State's responsibility to license power plants and to get us moving. It has been clear for a long time that Califor-

nia's siting process is broken. Although it has made cosmetic changes, the State has shied away from making meaningful reforms to the siting process.

The secondary cause of high prices is the disastrous regulatory rules imposed on the electricity market by the State. Unfortunately, the State has simply refused to act in a timely and effective manner. The California electricity crisis, in large part, is a result of inaction over a crucial 9-month period after the price spikes and supply shortages began in May 2000. This inaction forfeited the last chance to prevent a crisis. State rules barred California utilities from recovering wholesale power costs from retail rates, forcing utilities to buy power at 30 cents per kilowatt and resell it for 3 cents.

It was those rules imposed by the State of California that destroyed the financial health of the utilities and drove Pacific Gas and Electric into bankruptcy. If the State had allowed cost recovery, the utility's credit would not have been destroyed. PG&E would not have gone bankrupt, and the State would not be spending its surplus buying electricity and bailing out the very utilities whose credit is destroyed. The bankruptcy of PG&E could have been avoided if the State had allowed cost recovery.

Perhaps the most serious mistake made by the State was forcing the California utilities to rely entirely on the volatile spot markets for all of their power, even after wholesale prices had risen tenfold. If the governor had allowed the utilities to enter into bilateral contracts last year, electricity prices would be a fraction of what they are now. The State only recognized the need for bilateral contracts after the financial health of utilities were destroyed and the State assumed the burden of buying power for Californians. Once the State was paying the bills, it realized reliance on volatile spot markets was foolish and began to enter the bilateral contracts. Ironically, the contract prices California has announced, and much of this remains secret, indicated that they agreed to pay up to three times higher than what Duke Energy offered them last year.

The State's indecision on raising retail rates was another major mistake, one that led to higher rate increases than were necessary. Last fall, the utilities requested a modest rate increase. The State refused to consider this proposal, which directly led to the PG&E bankruptcy. In the end, the State ended up approving a much larger rate increase than was necessary if it had acted in a timely and effective manner. We governors have a lot of power. It is called executive power, and I truly believe that could have been used in this case.

Nine months after the beginning of this crisis, Governor Davis began to take action. In February, he announced an emergency plan to build 5,000 megawatts of new generation by July 1. According to recent reports, only 1,300 megawatts of plants that were under construction before his announcement will be available on that date.

Governor Davis announced a conservation plan to lower demand by 3,000 megawatts. I understand that plan also is falling short and may produce less than 1,000 megawatts in demand savings, which is a good savings, but nowhere near what the demand was.

The governor's plan to restore the financial health of Southern California Edison appears to be languishing in the State legislature, and I am glad the State is taking this action, but regret they only acted in response to a crisis, instead of trying to prevent one.

Threats by the governor and others to seize power plants and impose punitive taxes, which we did not do in Montana ultimately, will discourage what is needed most, investment in new generation. California has seen at least two power plants on hold now because of uncertainty about regulatory stability in California. As Senator Thompson said and one other power company said, "I have more confidence in regulatory stability in Brazil than I do in California."

If the governor takes a rash step, investment in new generation in California will come to a complete halt. The State will find itself in the business of generating and transmitting electricity on a permanent basis. The State will continue to spend billions of dollars on electricity instead of on schools. The power plants and transmission infrastructure will slowly degrade. And California's neighbors, Montana included, will find that they must continue to supply the power that California needs, since California refuses to provide it for itself.

The time has come to quit shifting the blame, quit shifting it to the Federal Government. We as governors have, as I said before, tremendous power to take advantage of our own destiny. FERC has taken strong actions to mitigate high prices in California. The time has come for the State to buckle down and do its job, ensure adequate electricity supplies for California consumers and businesses.

So please, I am asking you, do not put caps on the utilities of the Western States like Montana. It will be the same as inflicting foot-and-mouth disease on our agriculture industry. It will discourage construction of generators, it will discourage transmission, and it will surely discourage people from conserving, and it does not encourage us anymore.

I liked what Senator Carper said, that we are like the quarterback on a team and that you are maybe the athletic directors, but I tell you what. If the athletic director doesn't work right, the team is out of business, and I really see if you put price caps on us right now, if Governor Davis wants that for California, then I would advise him to do that for California. He has the power to. But do not inflict it by FERC on the rest of the States because it will kill us. Thank you.

Chairman LIEBERMAN. Thanks, governor. I have the feeling this morning that we are down on the field now. [Laughter.]

Ms. MARTZ. That is right.

Chairman LIEBERMAN. We are no longer athletic directors.

Governor Hoeven, thank you for being here. I look forward to your testimony.

TESTIMONY OF HON. JOHN HOEVEN,¹ GOVERNOR, STATE OF NORTH DAKOTA

Mr. HOEVEN. Chairman Lieberman, thank you for the opportunity to testify. I must say that I admire the diligence of both you as Chairman and the Ranking Member, Senator Thompson, for

¹The prepared statement of Mr. Hoeven appears in the Appendix on page 825.

conducting these hearings and sitting throughout. I appreciate it very much.

I have to say this. I do not know if I should, or not, but Senator Thompson, I really did enjoy your movies.

Chairman THOMPSON. I knew I would find somebody.

Chairman LIEBERMAN. Do not let this go to your head. [Laughter.]

Mr. HOEVEN. My comments today, and I will be brief, which I am sure you will be pleased to hear, my comments today will focus on the President's leadership in setting the right direction for energy policy. His plan calls for a market-based approach that will stimulate supply, promote conservation, and enable North Dakota and other States to meet this country's energy needs.

North Dakota exports 75 percent of the electricity generated in our State. We are encouraging the construction of new and efficient generation and the development of environmentally friendly renewable energy. We have also developed one of only two coal gassification plants in the world, converting coal into natural gas, and as you know, there is a tremendous need for natural gas right now, which will be a big benefit to California as they continue to site new power plants that utilize natural gas.

This diverse and growing energy portfolio will serve North Dakota's needs for a long time in the future while allowing the excess energy to be exported and help serve other parts of the country, like California. We are also one of the low-cost energy producing States in the Nation, using clean coal technology, natural gas, and hydro, a fact that we are very proud of.

We have worked hard to ensure that we have enough electricity to meet the demands of our consumers and businesses, and our citizens recognize that you cannot maintain economic growth if you lack the electricity infrastructure needed to encourage economic development and continued growth. We also see energy generation as an important job creator for our State's economy, while helping to meet a national need.

In order to assure economic growth, our State has a partnership called Vision 21, investing \$10 million with any company that undertake feasibility studies for new clean coal technology generation plants. This program will seek to access the clean coal program in the President's energy policy, if it is authorized by Congress, creating a Federal, State, private sector partnership for new energy generation.

For America to move forward and ensure our energy independence, our Federal Government must utilize market-based policies that will encourage new and efficient infrastructure. We must stimulate private investment in new generation and transmission in order to develop a vibrant, regional wholesale market. To do this, I believe the Federal Government has two roles. One is leadership, and the other is to provide market and regulatory certainty.

President Bush and Vice President Cheney have shown our Nation the leadership necessary to ensure our future energy independence. President Bush has developed a long-term national energy policy while also directing his administration to take steps that can help address short-term problems like that of the California energy crisis. The President's initiatives to help solve the

California energy crisis include: Two days after taking office, the Bush Administration extended emergency orders giving the State time to enact legislation authorizing it to buy power on behalf of Californians. A month after taking office, the President issued an executive order directing Federal agencies to expedite permits needed to increase electricity supply in California. In order to reduce demand, the President issued an executive order directing Federal facilities in California to maximize conservation this summer. And at the governor's request, Secretary Abraham asked FERC to extend a waiver for qualifying facilities from PURPA fuel requirements, a request that FERC granted. Finally, 4 months after taking office, the administration took the first steps towards removing a transmission constraint, the Path 15, that has caused repeated blackouts.

For a long-term energy independence, the President developed and released the administration's National Energy Policy. Not all of the recommendations are popular, but they all should be considered as part of a comprehensive national energy policy. America cannot depend on other countries to meet our energy needs.

In order for new investment to begin in some parts of the country and continue in others, we must ensure that there is regulatory certainty at both the State and the Federal level. State legislative and executive agencies must show they can assure the investment community that rules will be set and followed in an expeditious manner. We must ensure that agencies will make tough decisions, however unpopular, that benefit the good of the entire State and the region. The Federal Government, both Congress and the Executive Branch, must move expeditiously to change the laws and promulgate the rules necessary to move our energy and electric industries forward. The Congress must quickly decide what laws need to be repealed and modified to ensure a vibrant and efficient market. The FERC, EPA, Interior, and other agencies must implement sound, market-based rules and enforce them to ensure that market participants are playing fair while not gaming the system.

The FERC took a step in that direction on Monday. It remains to be seen if that order will work as designed, but we do know that all of their orders and rules must encourage new investment in electricity generation and transmission. Development of new transmission will require a reasonable return on investment and reasonable access to the infrastructure.

In closing, given the right type of Federal and State regulatory environment, private industry will make the large investments and long-term commitments necessary to build our energy generation and transmission infrastructure. President Bush has provided a road map for the Federal Government's role, a market-based approach that will help States provide industry with the regulatory certainty needed to move forward. Though there will continue to be bumps in the road, we are making progress. The challenges are great, but by working together, I am confident we can develop dependable, affordable, and environmentally sound energy for our future. Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, governor.

Governor Martz, in your statement, you put a lot of the blame for the crisis on inaction or mistakes by the State of California, by

the Government of California, but let me ask you this. I do think that Governor Gray Davis was asked most of the questions that you asked, so I think he has given his answers for the record. Part of his response, apart from his response to the specifics, was that the State of California, the people are doing what they can now, as much as they can do now, but because they are so adversely affected by the price they are being charged by the producers outside the State who are wholesaling electricity into the State, that they need help from FERC because only FERC can do anything to mitigate those prices.

It is probably hard to imagine. We were joking before about what if this had been Montana that had been affected by this crisis. But if it had been and you felt you were at a point, leaving aside what the causes were, at a point where you had done everything you could, wouldn't you also be appealing to us for the Federal Energy Regulatory Commission to help protect you from being unfairly treated by out-of-State wholesalers?

I am coming to your point that governors have great power. That is absolutely right. But they don't have the power, in this case, to regulate or at all affect, really, certainly the price charged by out-of-State producers of power.

Ms. MARTZ. That is a very fair question, Senator, and I don't believe I would be coming to the Federal Government for help. I really believe that I would, if I had the emergency powers that Governor Gray Davis does, I would be ordering facilities being built so that we could start to speak to our own energy needs.

You talk about them having to pay high prices. Because they are buying our markets, they are causing us to have to pay those high prices. They are not doing anything that we are not having to do because of them.

So I don't believe I would. You don't know until you are in those shoes, but I really believe this is something States should solve on their own and I really do think that he has some powers that he hasn't used yet.

Chairman LIEBERMAN. I know you criticized the State and the governor for not building enough power plants. I am sure you know that he was elected in 1998 and took office in 1999. It was pretty hard, I think, but let me ask you to respond, to have built enough power plants to have been on-line in that short of a time to deal with the price spikes that began to occur about a year ago.

Ms. MARTZ. Well, I think he could be having power plants on-line right now. He has got 6,300, I think, ordered. He has got 1,300 coming up, and they are not there yet. Each of us in our own States has to do what we have to do. We are looking at wind, we are looking at solar, we are looking at biodiversity, we are looking at coalbed methane, we are looking at coal, and we are going to be building as quickly as we can, also.

We have enough power in our own State—people say, well, you haven't built in your State, either. We haven't because we never needed to. We export almost as much as we use in our own State out of State. So we didn't need to build until California's crisis came upon us.

Chairman LIEBERMAN. Let me ask you this. I have a copy of a letter dated April 6 of this year that a number of governors in the

West, I believe all Republicans, sent to the Chair of the Federal Energy Regulatory Commission, and the two of you signed it. In it, it says, "Your resistance"—this is to Mr. Hébert—"your resistance to the considerable pressure to impose 'penny wise and pound foolish rate controls' has served a long-term interest of our region."

I wonder, now that FERC, most recently, 2 days ago, has acted to impose what some call price mitigation, some call price relief, some call price control, some call soft price caps, how you feel about FERC's action in light of your earlier request to the Chairman that they not impose, as I read it, any form of price controls.

Ms. MARTZ. In our State, already, meetings with the utility companies, we have a transition advisory committee working on these energy issues. Already, some of the utilities have concern over that. So we are going to have to see how that plays out. We did not have the full document. We had the press release from FERC that tells basically what that does, but we don't have the full document to be able to read that yet, so we will have to see how that plays out in our State. It may not be a healthy thing for us. We do not want price caps. We want the market to play itself out.

Chairman LIEBERMAN. Your 5 minutes is up, but I do want to give you a chance, Governor Hoeven, to give me your reaction to what FERC did on Monday.

Mr. HOEVEN. On the ruling? Well, I view it as price mitigation, designed to make sure there is no price gouging or overcharging. If it works that way and still allows the market to operate so that, again, we stimulate the increase in supply that we need, particularly in the Western area power pool, and at the same time encourage conservation, then it may work, and I think that is what remains to be seen.

And I think that is the point that I am trying to make. FERC has to set rules of the game that are certain so that industry can come in and make long-term commitments and make investments and know that not only are they going to be able to recoup that investment, but they are also going to have access to transmission lines they build and so forth so that they can do business and truly solve this problem for the consumers of California and other States.

Chairman LIEBERMAN. Governor Hoeven, am I right, North Dakota is not on the Western grid, is that correct?

Mr. HOEVEN. Right. We are in the mid-America power pool. Now, we are members of the Western Governors' Association and we sell power, of course, to a variety of other States.

Chairman LIEBERMAN. Right. So it is both as a seller of power, but also generally interested in electricity and energy issues, that you are here today.

Mr. HOEVEN. Ironically, this is an incredible opportunity for our State. We need development in rural North Dakota, in Western North Dakota. We have oil, we have gas, we have hydro, we have clean coal technology, we are converting coal to natural gas, we have bio-diesel, we have ethanol. We are busting at the seams trying to export energy to the markets that need it, but we need help from the Federal Government in terms of the rules of the game so that our companies can invest in transmission and get that power to market, not only in terms of recouping their investment, but also in terms of access to the line they have built. They might build a

transmission line and not even know what access their company is going to have on that line under the rules that FERC has because it is so much in transition and there is so much uncertainty.

Chairman LIEBERMAN. Thanks. Senator Thompson.

Chairman THOMPSON. Thank you, Mr. Chairman.

Governor Hoeven, I think you have hit right directly upon the nature of the problem when we try to look at FERC's actions, and I think you have the right solution, and that is certainty. I mean, that is what we look for across the board in our country. It is called the rule of law. You may have good laws, bad laws, indifferent laws, some kind of good, some kind of bad, but the main thing for business and for individuals is to know what the deal is, know the game that you are playing.

So now we are launching off under this great pressure. We are launching off into something that has something to do with the business' costs, figuring out all these suppliers, utilities, I suppose, what their real costs are and what is just. And we put FERC in the position of deciding, somebody withholds power and they say, well, we need repairs and what not. Well, what is really on your mind? Why are you really doing this? We put them in a position of deciding what is just.

So if I were thinking about building new power sources, I would have to wonder how certain is this. I mean, is somebody going to wake up some day and look at this thing totally differently? I think that is the problem. It is not that we can sit here and say that it is a good idea or a bad idea. I think hard caps are obviously a bad idea, but that is the problem.

Carrying it further, part of the problem with hard caps is that it is, as I said, a Goldilocks formulation, not too hot, not too cold, just right, and if we do this and if we do that and that works out, and we lift the caps when we say we are going to. What supplier believes government when they tell them that? There is no reason for them to believe. So it is uncertainty, again, and that is why you are seeing, I think, a lot of the comments you are seeing from potential suppliers in California.

I think, also, you are right when you say the prices are high, therefore, what are we going to do? We have got to look at that, and that is what we are looking at, but we also have to look at the front end. Why did prices get so high? How did it come about that we developed this supply problem?

Governor Martz, how is Montana affected by being a part of the Western grid when California is in the shape that it is in and urging the things that it is urging? All the talk is about California, as I am sure you know. All the concentration is about California. The lead-off witness, in effect, was the Governor of California. We spent all morning, just about, with the Governor of California. You other States are out there, too. And I might point out, as you said, eight of the 11 governors are Republicans and the three who are for price caps are Democrats. All three of those States will be represented here today, by the way, but eight of the 11 governors oppose price caps. Why is that and how is your State as a part of the grid affected by all the attention and the pressure that is being brought to bear on behalf of California?

Ms. MARTZ. Well, thank you, Senator, for the question. In the morning, when California wakes up, say if they are down 3,000 megawatts in the morning and they have to go out on the spot market and buy, we can't even buy power in Montana. Right now, we have tried—we are a regulated market until 2002 for our homeowners. Twelve major companies went off of that regulated market when we deregulated, had the opportunity to go off of the market. They are having a terrible struggle now buying power, even finding power to fill their need because most of the power is bought up at a higher price. We can't buy power. It is contracted out. We are looking at power, when the 2002 market comes up, we can't even satisfy the full load that we need for our homeowners because of what is happening in California. They are paying such high prices for it, so it is driving our prices up.

Chairman THOMPSON. And, of course, we only know part of the story. I can't figure out yet what has been released and what has not been released because the State of California has resisted, and relented, I think, partially now on releasing to the taxpayers of California and the ratepayers of California how much they are actually paying. And I think they still haven't released what the municipalities are paying. And you have suppliers out here who don't want to reveal the high prices they are charging. You have purchasers in California who don't want to reveal the fact that they are paying several times more than they would have paid last year if they had done what everybody was urging them to do. So we know they are paying higher prices. We don't know how much because of that.

I have a note here that you need to leave right away, and I think that is probably—well, my time is up. How convenient. [Laughter.]

Chairman LIEBERMAN. Thanks. I am going to let you go, but I cannot help but say you taught us something. You created part of a record here that we haven't had before, which is obviously that anybody on the grid is affected by what is happening in California, so that if the price goes up there, it makes it harder to purchase in Montana. But it also brings me back to the fact that, though I know you are opposed to any form of price mitigation or relief control, that if FERC imposed some sort of order here and lowered the price of electricity in California, wouldn't that help the folks in Montana?

Ms. MARTZ. No, because we then cannot even build more generation to keep in the State at all.

Chairman LIEBERMAN. Oh, well that is the tipping point.

Ms. MARTZ. See, what FERC did, it is important to remember, the only thing that they did, the only thing you can do to prevent blackouts is increase supply and reduce demand. Those two things, you can do. Yesterday's ruling doesn't address either of those. Price caps won't address getting more power.

Chairman LIEBERMAN. That is correct. Of course, these are only—I am going to let you go, but these are only temporary. I mean, there is no question that, conceptually, you could certainly reach a point where price caps were so severe that you would discourage supply. Nobody wants to get there. But what I am suggesting as I hear you is that some temporary price relief until supply can overcome demand in California actually would help folks in

Montana, too, because once the price is lowered there, you are not going to have to pay so much more to buy it off the grid.

Ms. MARTZ. But Senator, FERC admits this themselves. Anytime they have ever put a price cap, it has never been removed. So we are not looking at consistency for the producers at all, and, boy, if I owned it and I am a small business person, I would not invest. That is all I can say. And maybe some people can wait a year. Montana can't. We cannot lose any more jobs.

Chairman LIEBERMAN. I look forward to that oversight hearing, hopefully, in the not-too-distance future, when we press FERC as to why it has not removed the price cap.

Ms. MARTZ. Thank you.

Chairman LIEBERMAN. Because supply has——

Chairman THOMPSON. I thought you already guaranteed it would be temporary.

Chairman LIEBERMAN. Just listening to the governor, I said, if they do not remove a price cap, we will be back here when supply exceeds demand to ask that they do that.

Thanks so much for making the effort and taking the time to come out here and I wish you both well.

Ms. MARTZ. Thank you very much.

Mr. HOEVEN. Thank you very much.

Chairman LIEBERMAN. The next panel is the Hon. Attorney General of the State of Washington, Christine Gregoire, and Roy Hemmingway, Chairman of the Oregon Public Utilities Commission.

I thank you both for your patience. I thank you for coming out. I was honored to become Chairman of this Committee recently and I said I was feeling like I was Attorney General again, which was definitely six great years of my public service career. Of course, one thing I missed when I came here was that nobody called me "General" anymore.

Anyway, General, it is nice to have you here. We welcome your testimony.

**TESTIMONY OF HON. CHRISTINE O. GREGOIRE,¹ ATTORNEY
GENERAL, STATE OF WASHINGTON**

Ms. GREGOIRE. Thank you, Mr. Chair, Senator Lieberman, Senator Thompson. Thank you for the opportunity to come before you today and testify.

Let me also publicly thank both of our Senators from the State of Washington, who came before you this morning, for their support and their hard work with regard to the energy crisis facing the State of Washington.

I am here this afternoon primarily in my role as chief enforcer of the State and Federal antitrust and unfair business practice laws for the State of Washington. But I also come to speak on behalf of my colleagues from the State of Oregon and California regarding the multi-State law enforcement investigation that we began recently.

First, let me say that I am pleased that FERC recognized that this is a West-wide crisis involving all 11 Western States. Con-

¹The prepared statement of Ms. Gregoire appears in the Appendix on page 415.

sumers in my State have been paying extraordinarily high prices for the last year. These issues are not just about legalities and economic theory, but about, fundamentally, the day-to-day lives of people, our businesses, our schools, and our environment. Let me share some of the impact this crisis has had on the people of the State of Washington.

Our utilities, especially our publicly-owned utilities, have paid hundreds of millions of dollars for power over the last year. For example, Seattle City Light paid \$312 million to buy power on the open market this past year compared to a normal year in which it spends about \$50 million. Seattle consumers' rates were raised 42 percent since January of this year, and there is another expected rate increase of 22 percent in October. These increased costs reverberate throughout our economy and our society. Our schools have diverted funds from needed educational programs to purchase power, and we have idled or shut down major industries. Georgia Pacific shut down its Bellingham plant and idled 420 workers, citing power costs as the reason.

Let me turn now into the multi-State investigation into unlawful business practices. The multi-State investigation launched by the attorneys general of Washington, Oregon, and California focuses on the causes of the exorbitant prices charged to utilities serving the West Coast consumers. We are concerned that the energy prices and supply in the past year do not appear to be the result of natural market forces. In the past year, let me tell you what we have observed that has led us to this investigation.

First, the wholesale market rates for a megawatt hour of electricity skyrocketed from about \$30 to \$300, sometimes even as much as \$3,000. Were these massive price hikes caused by some form of unfair business practice or collusive activity among the generators and the marketers?

Second, sudden, unplanned maintenance outages at generating plants in California, to the point where 40 percent or more of the generation capacity has been consistently off-line, compared to historical averages of about 10 percent. What caused so many competing generating plants to suddenly go off-line at the exact same time?

Third, prices remaining high 24 hours a day, even though power is being purchased for off-peak hours. Why can prices stay so high when demand has been reduced?

Fourth, transmission capacity restraints during crucial times, further exacerbating the high prices and the availability of power. Were the companies exchanging confidential data in a joint effort to create transmission problems?

And fifth, suspicious activity in the California natural gas market, including claims that companies may have collusively agreed to suppress competition or otherwise engage in illegal activity.

If we ultimately find evidence to support a violation of Federal or State antitrust or unfair business practice laws, we will seek restitution, injunctive relief, civil penalties, and our costs for investigating the matter. In California, a criminal grand jury is being convened in early July to determine if criminal activity has taken place. That grand jury will be exploring State, RICO, or other criminal violations, including false claims under California law.

Let me note something else about our investigation. We are having difficulty getting access to power generators' records. California issued civil investigative demands on these generators in February. It is now June and these three States still do not have the documents that we requested. Some of the power generators are simply not cooperating, and this has delayed our antitrust investigation. They do this despite their public claims of full cooperation. Where is the cooperation with the chief law enforcement officers of these States? My question for the companies is, what do they have to hide? If you have not done anything wrong, let us see. Let us see the records on an unconditional basis in a way that is timely and responsive to our questions. Let the truth be the judge.

Now let me return to my role as public counsel for the ratepayers of the State of Washington. I understand how very complex this issue is both for FERC and for Congress. However, among all the complexities is a very simple, straightforward principle. FERC has a statutory duty to ensure that rates in the wholesale market are "just and reasonable." Though I am very disappointed that FERC did not act earlier to address the problem on a West-wide basis, I am pleased that it has now expanded its most recent order to provide relief West-wide. It is a step in the right direction.

I remain concerned that the order does not provide remedies for all of the harm that has been suffered by Washington State citizens, and I want to see if, in fact, at the end of the day, it does address the problems prospectively. For those reasons, I would like to encourage this Committee in its oversight role to do the following.

First, monitor carefully the implementation of FERC's order. Judge its effectiveness by FERC's statutory duty to ensure just and reasonable rates.

Second, ensure FERC has the resources and the guidance to continually monitor the market and investigate rates that may be unreasonable, to enforce its order and any subsequent orders designed to make the markets work, and to provide appropriate refunds to all consumers, including those in California.

Third, if this order does not appear to be working, FERC must take immediate, decisive, corrective steps to ensure that the rates are just and reasonable. In addition to protecting ratepayers, FERC must be vigilant to make sure that energy efficiency and protection of the environment is an essential part of any solution, both short- and long-term.

Again, these competition and FERC issues, are not just about legalities. They are not just about money. They implicate the day-to-day lives of our citizens, our businesses, our schools, and our environment. As we move forward, we must keep these interests, truly the public interests, in the broadest sense, in mind.

In conclusion, this energy crisis has had a tremendous impact on my State's citizens, its business, its economy, and its environment. It is a West-wide problem and has been going on now for a year. Although we will continue with our law enforcement investigation, FERC really is uniquely situated to monitor this energy market and to provide the appropriate remedies to all who have been harmed by unjust and unreasonable rates. We ask this Committee to make sure that, in the end, FERC fulfills its mandate that en-

ergy rates be just and reasonable at all times for consumers. Thank you again for allowing me to testify.

Chairman LIEBERMAN. Thank you, General, for that testimony.

Mr. Hemmingway, welcome.

**TESTIMONY OF ROY HEMMINGWAY,¹ CHAIRMAN, OREGON
PUBLIC UTILITIES COMMISSION**

Mr. HEMMINGWAY. Thank you, Mr. Chairman and Senator Thompson. I am speaking today as the Chairman of the Oregon Public Utility Commission. At the beginning, I want to make three points clear about Oregon's position.

First, Oregon believes in competition in markets. We have begun a gradual and flexible opening of our retail electricity markets to larger customers, but due to the Western power crisis, even this go-slow approach is in political trouble and I cannot predict its future in the Oregon Legislature at this time.

Second, Oregon believes in sending appropriate price signals to retail consumers. We have passed on prices to consumers, as have some publicly-owned utilities in Oregon, and this crisis has not been brought about by the failure to pass on higher prices. Passing on to consumers unjust and unreasonable prices at 1,000 percent above cost will not alleviate this crisis.

Third, Oregon does believe that there is a shortage of electricity in the West. Some of this, a good deal of it, is caused by the fact that we have had a drought year in the Pacific Northwest. If we had had the rainfall we had in 1998 and 1999, we would not be here today. There would be plenty of electricity and our plans to build new generation would come on-line just in time.

I say all this to emphasize that we who advocate serious Federal intervention in the Western power markets have been doing our part to augment supplies. We are not against market competition in the electricity business. We are not advocating repeal of the laws of supply and demand. We are simply asking that the Federal Government undertake its historical role in regulating electricity marketplaces when they are characterized by high prices and inadequate numbers of competitive suppliers.

The principal argument that FERC has given for not imposing serious wholesale price controls is that they will work against bringing increased supply to the market. FERC seems to confuse here long-term supply issues with the immediate need in the Western market for power supply. There is no way, as I think other witnesses have indicated, that the amount of supply that would create a truly competitive market that could be built in time to significantly temper the prices that utilities have been paying in the wholesale market in the last year. The lead time is simply too long.

Oregon, for instance, has under construction 1,500 megawatts of new generation, and we have in a plant in the permitting stage 3,000 megawatts of new generation, and in the planning stage even more. This is in a State with 5,500 average megawatts of consumption, 10,000 megawatts of peak, so this is an extraordinary amount of generation that is under construction. But only one of these plants of about 400 megawatts will be on-line by July to meet the

¹The prepared statement of Mr. Hemmingway appears in the Appendix on page 423.

summer problem. Not enough generation is likely to be able to be brought on-line this summer to alleviate the real and contrived shortages in the Western market.

In summary, the high prices supported by FERC are simply not needed to stimulate investment in long-term generation because—long-term investment in generation, because that is occurring, and they cannot magically bring in new supplies in time to deal with the crisis this year.

Theoretically, high wholesale prices should stimulate suppliers to bring on generation in the short term that would otherwise not come to market. But in truth, the unfettered wholesale market favored by FERC has done little to increase supply. Over the last year, the California market, in particular, has been characterized by record levels of plant outages, despite these stratospheric prices.

The high prices have had a perverse effect. Owners of generation do not need to bring new supplies to the market in order to make record profits, which almost all the energy suppliers in California have done, if you look at their balance sheets. Without colluding, energy suppliers can figure out that not bringing every kilowatt to the market will boost prices and create profits. Only as power prices have declined in recent months have we actually seen lower plant outage rates. The shortage has given incentive to suppliers not to bring all their supplies ready to the market because it has meant that they get higher prices.

I would like to turn now to the June 18 order that FERC issued this week. I believe this order is a step in the right direction, but I want to make clear that it is a small step and it will not end the worst abuses that have characterized the Western power market this year. The order remains flawed in fundamental ways.

It allows all sellers, no matter what the cost of their generation, to get the price of the highest cost resources operating at the time. While marginal cost pricing of this kind is appropriate for commodities in a competitive market—I think any economist will tell you that—in a market where consumers have choices, electricity in the Western power market has not yet reached that point. Electricity is a commodity for which there are no immediate substitutes and there are no technically feasible ways yet to send immediate retail price signals when wholesale prices are high. High wholesale prices on a hot July day do not mean that consumers will get that signal at the right time to reduce consumption and reduce the costs to the utility system.

Worst of all, the new FERC order still provides incentive for gaming of the system by suppliers. All power sold in the market gets priced, as I said, at the cost of the highest and most expensive resource running at the time. As a result, there is still incentive for suppliers to ensure that there are not enough efficient resources running and that the inefficient price-setting resource does operate.

With supplies tight in a small number of suppliers, a non-competitive market results where individual suppliers can anticipate the actions of others. FERC has not yet shown that high wholesale prices in a non-competitive market will deliver equal or more short-term supply than in a fully-regulated market. In fact, recent history suggests the opposite.

FERC is still acting as if electricity in the West were like wheat or pork bellies, where buyers can find substitutes and respond to high prices and no one supplier can affect the market or anticipate how other sellers into the market will respond. None of these conditions is true. In the current Western power market, we do not have a competitive market.

For over 60 years, FERC and its predecessor, the Federal Power Commission, oversaw conditions that created a stable power market that brought electricity to utilities and consumers at affordable prices and rewarded investors with reasonable rates of return. FERC's recent ideological devotion to free-market principles in a market that is anything but free and competitive has shattered the public's faith in the Federal Government's willingness and ability to ensure an adequate and affordable supply of power. FERC's actions threaten to bring a political end to appropriate deregulation initiatives around the country, such as Oregon. This is a sad legacy, indeed, which I hope will be remedied as swiftly as possible by the Congress. Thank you.

Chairman LIEBERMAN. Thanks, Mr. Hemmingway.

You touched on something fundamental to the FERC order that I want to ask the commissioners this afternoon, because although it is a step forward, there remains the question from our perspective, how much of a step forward? And it does seem to me, as you said, and I appreciate it, because you are a regulator, a utility regulator, that they have created a system here, the so-called proxy pricing, which stated in complete layman's terms does peg the price to the highest price obtained in a given period on the market and it allows everybody to come up to that price. As I understood it, in the off-peak hours, they can charge up to 85 percent of that high price. So it is a ceiling, and I suppose it will, therefore, protect consumers from the most extreme price hikes, but it is a pretty tall ceiling.

What would you have done if you were a one-man FERC in this case?

Mr. HEMMINGWAY. Mr. Chairman, I would have looked for the possibility of reimposing cost-plus price controls. You can provide plenty of incentive and reward for investment with a cost-plus arrangement without allowing a supplier to get 1,000 percent greater than its costs when selling into the market.

Chairman LIEBERMAN. And that is what we traditionally have thought of as utility regulation. Again, we are all for—not all, but I am certainly for deregulation with competition. It does strike me that the cost-plus system—the idea that you get your money back that you spent plus some reasonable profit—is also easier to apply than this system. It is certainly easier to understand, for me, than this system that FERC has adopted. Am I right from a regulator's perspective or not?

Mr. HEMMINGWAY. Well, there is the problem that there are hundreds of transactions that are going on and these have to be tracked.

Chairman LIEBERMAN. Right.

Mr. HEMMINGWAY. But FERC is experienced at this. After all, it did it for over 60 years, so I think they could go back to that.

And I am for competitive markets and believe it is a better way to price a product than is regulation, but you need to have a fully competitive market with multiple suppliers in it in order to get to that point where you can say that that kind of pricing is appropriate and I do not think we have that in the Western power market today.

Chairman LIEBERMAN. Right. General Gregoire, obviously, the FERC order is good news for Washington State and the rest of the West in that it both extends the previous FERC order to 24 hours a day, 7 days a week, but more importantly for you, it extends the order throughout the Western grid, including your State. The bad news for your State, obviously, is that there is nothing said regarding refunds that you think you are entitled to. So let me ask you, what, if anything, the State can do to right that wrong, and if you have any counsel for this Committee or for FERC, I suppose, as to how to deal with the question of refunds that electricity customers in Washington State may be entitled to.

Ms. GREGOIRE. Well, thank you, Mr. Chair. I am one who believes that there have been unjust and unreasonable rates beginning about June 2000 and that needs to be corrected and refunds are in order, and you heard from both of my Senators this morning speaking to that issue, as well. FERC has suggested that it does not think it has the legal authority in that the Federal Power Act would call for it to be able to give refunds only 60 days after it had opened its investigation, and that would, for purposes of this particular instance, for the West-wide investigation, didn't occur until April 26.

The problem with respect to that is we have been asking for a West-wide investigation for some time. California utilities first approached to FERC in August. It was joined by Washington in October. FERC declined to do a West-wide investigation in December. A motion for rehearing was brought in January, supported by Washington. We went to the D.C. Circuit to ask the D.C. Circuit to order FERC to open up a West-wide investigation, and that was declined.

At the end of the day, our consumers may be with no redress if they have to turn to FERC. I think that is fundamentally wrong. At the end of the day, our antitrust investigation may provide a remedy, but I am not optimistic that will be done soon given the lack of cooperation with the generators. Sometimes that takes years to accomplish.

So if, in fact, FERC says it has no jurisdiction and we are unable in reconsideration to convince them otherwise, I would ask this Committee to take that issue up so that we do not find this situation occurs again in the future.

Chairman LIEBERMAN. So the current procedure is that you are not entitled to refunds until the period covered 60 days after an investigation—

Ms. GREGOIRE. Is opened. Correct.

Chairman LIEBERMAN. I know this should be clear to me, but it is not. Has FERC reached a conclusion for parts of the Western grid outside of California that the rates charged are now unjust and unreasonable?

Ms. GREGOIRE. Correct. They did in their order on Monday.

Chairman LIEBERMAN. On Monday.

Ms. GREGOIRE. So it only goes back the 60 days from the time they opened that investigation, which would put refunds due to the rest of the West to begin in July.

Chairman LIEBERMAN. Yes.

Ms. GREGOIRE. That is fundamentally unfair, since our consumers have been harmed now for a year with unjust and unreasonable rates.

Chairman LIEBERMAN. Yes, I agree with you. It is very unfair. So you are suggesting that the Committee may want to look, assuming that you will do everything you can to try to obtain refunds through litigation and other means, appeals to FERC, that the law itself is flawed and we ought to, as one result of these oversight hearings, deal with how to correct that inequity so it doesn't happen again?

Ms. GREGOIRE. We would ask you to do so, yes.

Chairman LIEBERMAN. My light is flashing. My time is up. Thank you. Senator Thompson.

Chairman THOMPSON. Thank you, Mr. Chairman.

Mr. Hemmingway, Governor Davis has been critical of the amounts charged by the Bonneville Power Administration, which, of course, is big in your State. Do you believe that Bonneville has engaged in price gouging?

Mr. HEMMINGWAY. Senator Thompson, no, I don't believe they have been. They have been selling into the ISO market and been a price taker in that market, and I think that they have been able to resolve their issues with Governor Davis on that. I mean, we can check with him. They have not been able to set the price of the power that they sell into that market. They merely take whatever the market clearing price is of that day.

Chairman THOMPSON. So you would disagree with the governor with regard to that particular entity, anyway.

Mr. HEMMINGWAY. [Nodded head up and down.]

Chairman THOMPSON. General Gregoire, with regard to your investigation, you were talking about the generators and, of course, you and I both know that saying, "I am from the government and if you don't have anything to hide, turn over your records," is not the standard, of course, that we normally use in court or anywhere else. In fact, civil libertarians would have a hard time with that if it were anybody else except power generators.

But having said that, you say you have issued subpoenas. How many generators have you subpoenaed?

Ms. GREGOIRE. We have issued civil investigative demands, and what that provides for those companies, by the way, is absolute confidentiality, and to date, the companies that have not complied are Duke, Mirant, and Reliant. We have had cooperation, on the other hand, from AES and Dynergy. We have yet to issue with regard to a couple of the other companies and we are in the process of doing so now.

Chairman THOMPSON. How many have you issued so far?

Ms. GREGOIRE. Well, we have sent ones to Mirant, Reliant, Dynergy, Dynergy Inc., Dynergy Energy Services, Duke Energy Corp., Duke Energy Trading and Marketing, Duke Energy Power Services, and AES.

Chairman THOMPSON. How many of them own generation facilities in Washington?

Ms. GREGOIRE. None of them do. They sell into Washington State.

Chairman THOMPSON. What percentage of the wholesale market do these generators supply to Washington?

Ms. GREGOIRE. Well, let me give you an example. In Washington State, for example, the purchases last year to Washington companies by AES was \$15 million, by Enron was over \$1 billion, by Dynergy, \$195 million, Mirant, \$283 million, and Reliant, \$224 million.

Chairman THOMPSON. Generally, what percentage of the wholesale market would that be?

Ms. GREGOIRE. I don't know that.

Chairman THOMPSON. Well, it seems as if it would be a very small percentage of your overall wholesale market.

Ms. GREGOIRE. We do not rely—most of our power comes from Bonneville.

Chairman THOMPSON. Well, that was—

Ms. GREGOIRE. We cannot rely on these generators.

Chairman THOMPSON. That was going to be my next question. What are the largest wholesale suppliers, electricity suppliers, in your State, Bonneville?

Ms. GREGOIRE. Correct.

Chairman THOMPSON. Who else? Powerey?

Ms. GREGOIRE. We have some coal, we have some nuclear, and we have these generators, primarily.

Chairman THOMPSON. What about BC Hydro or Powerey?

Ms. GREGOIRE. We have some, yes.

Chairman THOMPSON. That is electricity generation, of course. Bonneville is electricity.

Ms. GREGOIRE. Right.

Chairman THOMPSON. Have you issued subpoenas to them to investigate their role in this?

Ms. GREGOIRE. We have had full cooperation by Bonneville. We have not yet issued anything to any of the generators in BC Hydro.

Chairman THOMPSON. So I suppose if I was a generator out there, when you are talking about compliance, I would wonder why you would be issuing these subpoenas or requests, whatever you call them, for those companies that have very little—have no presence in your State, supply what seems to me to be a small percentage of the wholesale market, on the one hand, and you really haven't done the same thing with regard to those generators who supply a much larger percentage of your market.

Ms. GREGOIRE. Well, Senator, it is a multi-State investigation involving all three States, and, of course, these generators are located in California and have not cooperated with California at all, as well. They have refused to provide documents to California and, in fact, have brought a protective order motion in court to ensure that whatever documents they get, they cannot be released to either Washington or Oregon.

Chairman THOMPSON. Of course, that is normal when a governmental subpoenas documents that they are not put on the public record unless there are further legal proceedings. Whether or not

a company is cooperating, of course, begs the question, whether they are properly exercising their legal rights that any company or any citizen has in this Nation. So the fact that they are or are not cooperating, of course, begs the question. You will have to resolve that, as to whether or not they are not cooperating for appropriate reasons. But again, if I were one of them, I would be wondering why you are going after all these out-of-State folks and not going after the ones that are supplying most of the power.

I have nothing further.

Chairman LIEBERMAN. Thanks. Very brief factual questions. Earlier, one of the Senators from Washington State said that she thought that the increase in electricity costs in the State was a multiple of 11 times in the last year. Is that right?

Ms. GREGOIRE. That is correct.

Chairman LIEBERMAN. And what would be a comparable figure for Oregon?

Mr. HEMMINGWAY. Mr. Chairman, it would be a comparable figure for companies that are buying in the wholesale market. We have a number of utilities which are largely publicly-owned utilities which have bought a percentage of their power at those prices and they have had to raise their retail rate as a result by 20 to 40 percent.

Chairman LIEBERMAN. Is it possible to state what percentage of that in each of your States, roughly speaking, is derivative from the problem in California and what percentage is more home grown, if you will? If you can answer that, fine. If you cannot, then we will let you think about it and submit a written answer.

Mr. HEMMINGWAY. Mr. Chairman, it is one grid, and so it is very difficult to separate out the problem as a result of the drought from the problem in California.

Chairman LIEBERMAN. That is what I was thinking.

Mr. HEMMINGWAY. As I said before, if we were not having a drought, even California would not be having a problem, in my opinion, because we export so much power from the Pacific Northwest in good water years to California that it—that is the reason, essentially, these problems started to creep up in the year 2000, was that the first year that we did not have, in a long time, really large exports to California.

Chairman LIEBERMAN. General, a final question. In light of your multi-State investigation, to the best of your knowledge, is the Antitrust Division of the Justice Department investigating this matter at all?

Ms. GREGOIRE. No. To my understanding, the U.S. Department of Justice is not involved. We have asked them to join with us in the investigation and they have not joined us as yet. It is a three-State multi-State investigation.

Chairman LIEBERMAN. How about the Federal Trade Commission? Do you know of any—

Ms. GREGOIRE. No.

Chairman LIEBERMAN. No active investigation? I do not have any other questions.

I thank you for coming out, for your patience. Your testimony was very helpful. I appreciate it very, very much and wish you a safe trip back home.

Ms. GREGOIRE. Thank you.

Chairman LIEBERMAN. Senator Thompson, it is my inclination now to take a half-hour break to allow everyone who must be here to stretch their legs and get some lunch and we will be back at 2:15 with the five members of the Federal Energy Regulatory Commission. The Committee stands in recess.

[Recess.]

Chairman LIEBERMAN. The hearing will come back to order.

I thank the five members of the Federal Energy Regulatory Commission, at times in its history little known, I would say now probably at one of its highest points of visibility with all the attendant responsibilities thereto.

I think you know that this Committee is an oversight committee. And the hearings we are conducting here are pursuant to that authority, to make a judgment as to how your commission has been responding to the general subject or matter of energy deregulation with particular regard, of course, to the electricity markets in the West, and most especially in California. We heard testimony last week from some leading economists. We heard testimony today—perhaps you followed it—from Governor Davis, Governor Hoeven, Governor Martz, Attorney General Gregoire of Washington State, the Chairman of the PUC from Oregon, Mr. Hemmingway, and members of Congress.

I know that you have some prepared testimony. Mr. Hébert, I want to start with you and we will give each of the members a chance after that. We have been running a 5-minute clock on the witnesses. Mr. Hébert, if you go a little longer, I do not think we will physically eject you from the room. And then Senator Thompson and I will proceed with some questioning.

Thank you for your understanding about the time pressures today and keeping yourselves available. I appreciate it. It is important business and you are right at the heart of it, so we thank you for being here. Mr. Hébert, it is all yours.

**TESTIMONY OF HON. CURT L. HÉBERT, JR.,¹ CHAIRMAN,
FEDERAL ENERGY REGULATORY COMMISSION (FERC)**

Mr. HÉBERT. Thank you, Chairman Lieberman. Thank you for the opportunity to appear here to discuss the Federal Energy Regulatory Commission's role in restructuring of the electricity markets.

The Commission's experience in regulating electric and natural gas utilities and, indeed, the Nation's experience in pricing and allocating vital goods and services have taught us an important lesson. Consumers are better off if supply and pricing decisions are based on market mechanisms rather than bureaucratic fiat. Thus, the Commission is committed to helping move this country toward open, competitive energy markets.

At the same time, we recognize we must ensure that broken and dysfunctional markets are fixed. This poses challenges, particularly in California and the West, where there is a substantial imbalance of supply and demand.

In response to these challenges, the Commission has been working aggressively to reform market structures and to enhance con-

¹The prepared statement of Mr. Hébert appears in the Appendix on page 430.

sumer welfare in California and the West. The Commission has not lost sight of the point that the best way to lower wholesale electricity prices and to keep them low is to promote investment in badly-needed supply and delivery infrastructure and to encourage demand reduction. The Commission's task remains to balance these goals to ensure that short-term measures do not undermine long-term priorities.

My written testimony, which I submitted Monday morning, describes the dozens of orders the Commission has issued in recent months addressing California and Western energy markets. The Commission has done everything that it can within its jurisdiction to extract every last drop of electricity out of existing resources and to free up additional megawatts from demand reduction initiatives. Moreover, the Commission has been no less active in its efforts to investigate and lower the price of natural gas in and bring additional pipeline capacity to Western markets.

In my limited time this morning, I would like to focus on action undertaken by the Commission on Monday afternoon after the filing of my written testimony. By a unanimous 5-0 vote, the Commission expanded the scope of a market monitoring and price mitigation plan for California and the West. An earlier version of that plan went into effect on May 29 of this year. Since that date, as we all know, prices of electricity and natural gas in both spot and forwards markets have plunged dramatically. Energy prices in California and the rest of the West are lower than at any time in the past year and are coming close to prices in the rest of the country.

Building on that success, the Commission voted unanimously to expand its price mitigation plan for California's spot market sales to all hours of the day. The Commission also extended the limitations on spot prices to all 11 States in the Western System Coordinating Council. The details of the Commission's plan are many. For this reason, I have submitted for the record the Commission's 60-page order which was issued yesterday afternoon and a 7-page press release on the order which was issued Monday afternoon.

In a nutshell, the price mitigation ordered for the West and applicable during all hours is based on the market clearing price concept adopted in the Commission's April 26 order. The market clearing price is based on the bid of the highest cost, least-efficient unit in California that is called upon by the California ISO to serve load during any day in which available reserves dip below 7 percent. Sellers other than marketers have the opportunity to justify individual prices above the market clearing prices based on their costs.

I am very proud of the Commission's approach toward reforming California and Western electricity markets. The Commission's mitigation plan manages what many said could not be accomplished, restraining prices while encouraging investment. The key is that price mitigation is based on market forces. The market clearing price is not a blunt, arbitrary figure that bears no resemblance to market conditions and is subject to political pressures and whims.

That is what was tried in California just last summer, Mr. Chairman. The ISO lowered the price cap last summer from \$750 per megawatt hour to \$500 per megawatt hour and then \$250 per megawatt hour. All this did was cause an increase in the average

electricity price and a reduction in the ability of the ISO to procure emergency power. Indeed, last December, the ISO, the California ISO, begged the Commission to allow it to remove the cap, explaining that it was impairing the ISO's ability to meet demand and undermining the reliability of the electrical grid, what we knew all along.

Also, the mitigation price is not based on the cost of individual generators. A return to traditional regulation would entail months and perhaps years of administrative and appellate litigation over cost structures and reasonable rates of return. This type of delay and uncertainty is simply unacceptable at this critical juncture.

The other point that certainly needs to be made is that under that scenario, Mr. Chairman, the most inefficient units would be guaranteed profits probably at levels that they will not get under our plan. Even more disturbing, regulation based on cost would provide no incentive for the various suppliers to become efficient and to reduce their costs and thereby lower prices for consumers. The Commission's plan, on the other hand, provides every incentive for suppliers to reduce their costs and improve their efficiency. Nothing is now guaranteed.

A generator or a marketer now makes money by increasing the efficiency of production. Its profit is determined by how much of a differential there is between its own cost of production and the cost of least-efficient, last-dispatch unit. A generator is now able to recover its fixed costs, but the extent of its capital recovery and the size of its profit is determined by the very efficiency of its operations, Mr. Chairman.

In this manner, a generator will find it profitable to retire old, dirty, inefficient units and replace them with new, cleaner burning, more efficient units. I am very proud of the green initiatives of the Commission's plan. The best way to clean our air, as we all know, is to never pollute it in the first place.

And finally, through enhanced monitoring and coordination of generator outages, along with additional tools to act against withholding and other forms of anti-competitive behavior, the Commission has removed any doubt in that we are committed to ferreting out and remedying any form of market manipulation and behavior no matter when it occurs, 24 hours a day, 7 days a week.

As Monday's order makes clear, anti-competitive behavior simply will not be tolerated by this Commission. Indeed, in Monday's order, the Commission directed Duke Energy to make refunds for the period earlier this year when it charged California consumers approximately \$3,800 per megawatt hour for electricity. In other orders this year, the Commission has directed the refund of over \$130 million for past overcharges and manipulative behavior and has ordered an expedited hearing into allegations of affiliate market power abuses concerning the transportation of natural gas to the California border. Other investigations are underway, as well.

There should be no doubt that this Commission is actively pursuing refunds and other appropriate remedies for past behavior. Frankly, I believe that the best way for California consumers to be made whole is, if possible, to have the parties themselves negotiate a fair and comprehensive settlement of all outstanding refund issues. The Commission is not ducking these issues. Rather, it is

giving the parties, including the State of California, 3 weeks, which is not a lot of time, to do what is best for the people of California.

I hope that all parties will come to the table. I hope that all parties themselves will spare consumers the pain and uncertainty of protracted litigation over past market behavior. If, however, these parties are unable to reach agreement, the Commission stand committed to act quickly and decisively to resolve these issues.

As for the rest of the West, the Commission's refund authority presently extends from July 2 of this year, the earliest refund effective date allowed under the Federal Power Act. I understand the pleas for an earlier refund effective date, and this is a matter that the Commission is currently considering on rehearing of its December 15 order of last year. In that order, the Commission denied a complaint brought by Puget Sound Energy which sought an investigation into rates charged, not for the entire West, but rather one limited to the Pacific Northwest.

I can state, however, that Western parties outside California are not shut out of the settlement discussions scheduled to commence next week, as of Monday. To the contrary, those discussions are open to all entities which are parties to the proceeding that was the subject of Monday's order. Those parties include Puget Sound Energy, the City of Seattle, various Pacific Northwest utilities and industrial companies, and the Bonneville Power Administration.

In conclusion, the Commission has been doing a great deal of work to help ease the present energy problems in California and the West. The Commission's efforts have contributed to the recent decline in Western energy prices. Monday's order, issued by a unanimous Commission, improves upon a plan that is good for California, good for the Pacific Northwest, and good for the entire West.

It is a plan that respects market forces and that attempts to restrain prices, while at the same time offering incentives for investment in supply and delivery that is the only real solution for the West's immediate energy problems. It represents an effort to provide relief now, while making sure that mitigation is short-lived. The Commission's goal remains to fix dysfunctional markets and to ensure that markets regain their competitive footing as quickly as possible.

There has been a lot of talk about the past and I would like you to know, Mr. Chairman, Senator Thompson, and the Committee, that this Commission—I can't speak for a previous Commission, I can't speak for a Commission prior to January 22. I had no control over that agenda. But I will tell you, sirs, that we have been engaged. We have issued over 60 orders for the State of California. We have issued a price mitigation plan. We have improved upon that plan. We have issued refunds that no other Commission has done. We are moving forward quickly. We are trying to resolve gas issues, asking for transparency. We are committed, and I assure you, sirs, I assure the members of this Committee that I know in my educated mind and I truly believe in my heart that we are well on our way of improving this marketplace and getting them on their feet while bringing the consumers reasonable prices, but at the same time attracting necessary investment.

I read in today's issuance of the *Wall Street Journal*, and I brought up websites that say, under this order, they remain bullish and are bringing opportunities into California, and I think we have done it right and I am committed to it. Thank you, sirs.

Chairman LIEBERMAN. Thank you, Mr. Chairman.

Just as a point of clarification, I appreciate your testimony. I think you said some things there that are directly responsive to questions that were raised by the witnesses this morning. I just want to clarify what you said, and then I will go on to the other Commissioners. You said that once the 15-day period that is called for in the order, Monday's order, in which parties will work together under an administrative law judge on the question of refunds, that if that does not reach a solution that is satisfactory to the Commission, that the Commission might—or satisfactory to the parties, that the Commission would consider reentering on those matters.

Mr. HÉBERT. Let me take 15 seconds. One, I did not get to see this morning's hearing. As you know, we are busy.

Chairman LIEBERMAN. Right.

Mr. HÉBERT. But I will tell you that the process is there is 15 days for the parties to reach settlement. If not, this Commission by a vote of 5–0 has instructed the administrative law judge to recommend to us a settlement within 5 days of that—I am sorry, 7 days of that.

Chairman LIEBERMAN. OK.

Mr. HÉBERT. So 22 days, and then this Commission can act.

Chairman LIEBERMAN. And just on the second point, which was obviously of concern to people in Washington State and Oregon who believe that their quest for refunds is not within the purview of the administrative law judge, did I hear you correctly to say that, as you understand it, that they are wrong, in other words, that the judge will consider their request for refunds, as well?

Mr. HÉBERT. You are going to require me to be very careful here, and let me do it.

Chairman LIEBERMAN. I am not meaning to put any words in your mouth.

Mr. HÉBERT. No, you are not.

Chairman LIEBERMAN. I just wanted to make sure I understood what you were saying.

Mr. HÉBERT. This is a very delicate situation because I have the December 15 order, which speaks to that, under rehearing at this time, so I do not want to conflict myself out on that case, so I have to be very careful in my answer.

The beauty, I believe, as an attorney who has been involved in settlement processes, I will tell you that there are two things that settle issues and cases, uncertainty and deadlines. You trade certainty for uncertainty and there is a deadline that closes it out.

We did not define the parameters of the settlement process. We left it open. That is, in fact, the beauty of the process. They are parties to that process. They will be in the room. It will be up to them to negotiate what they believe to be in the best interests of them and the parties that they represent.

Chairman LIEBERMAN. Well, that is very heartening. I just saw a copy of a letter that is on its way to you—maybe you have re-

ceived it already—from some of the Congressional delegation from Washington State asking these questions, so they will be grateful for that. I will hold my additional questions.

Commissioner Breathitt, welcome. Thank you.

**TESTIMONY OF HON. LINDA K. BREATHITT,¹ COMMISSIONER,
FEDERAL ENERGY REGULATORY COMMISSION (FERC)**

Ms. BREATHITT. Thank you, Mr. Chairman and Members of the Committee. I appreciate this opportunity to appear before you this afternoon to discuss the role of the Federal Energy Regulatory Commission regarding the restructuring of California's electricity market and its implications for other States and regions.

The problems that have been experienced by consumers in the West have been the primary focus of the Commission for almost a year now. What we have learned through our investigations and inquiries is that the causes of the present energy situation in California and other Western States are highly complex and multifaceted. I am sure you heard a lot of that this morning. I believe the Commission has taken bold and decisive actions within our jurisdiction to remedy the extreme distortions in the California markets and to address the instances of potential market power abuses.

Since last August, the Commission has issued over 50 orders—I think the Chairman said 60 now—implementing important remedial measures and price mitigation mechanisms, instituting investigations into rates and market design flaws, establishing programs to maximize electricity supply, delivery and demand reduction, directing sellers to provide refunds of excess amounts charged for certain electric energy sales.

Our actions are starting to have a dampening effect on prices in California and the West. Prices have decreased significantly since our market monitoring and price mitigation plan for California took effect on May 29. For instance, during the week of June 9, prices for spot purchases of power at Western trading hubs fell to less than \$55 per megawatt hour from a high of about \$170 per megawatt hour earlier in the week. The low prices continued into the next week, and equally important to me, the price for the longer-term contracts has also come down dramatically. We have seen forward contracts drop for 2003 to \$41 per megawatt hour in the past month.

We have long stressed—the Commission has long stressed the importance of long-term contracts to minimize the reliance on the volatile spot market, and I believe we are down to about 20 percent from 100 percent when we started issuing our orders.

In my pre-filed testimony, I highlight several of the major orders that we have issued and I hope that you will note those when you are going through the testimony. It is important for your Committee to understand the breadth and the scope of our myriad actions in the Western energy crisis. Critics have said we have done nothing and that is simply not true.

¹The prepared statement of Ms. Breathitt with an attachment appears in the Appendix on page 462.

My testimony also discusses the relationship between the problems we are experiencing in Western energy markets and those in natural gas markets and I point to numerous impediments in natural gas markets that must be addressed.

I have a deep concern about the impact of the prolonged periods of high natural gas prices on industries and communities in the West and particularly the impact on the electric generation costs, since so many of the units in California use natural gas.

But this afternoon, I would like to focus on our most recent action. On Monday, the Commission instituted a market monitoring and price mitigation plan for the entire Western United States. These new procedures build on our April 26 order, which implemented similar orders just in California, and we initiated the investigation that has made it possible to cover the entire Western United States back in April.

The plan that we announced is designed to reduce prices in all hours that are just and reasonable and to emulate prices that would be present in a competitive market. The purpose of the plan is to stabilize the market in the short term and permit California and the Western States to repair dysfunctional market mechanisms. The mitigation plan is intended to provide breathing room for the markets to self-correct. Importantly, the plan will apply to all sellers, including marketers and non-public utilities across California and the balance of the United States portion of the Western States Coordinating Council.

I fully support the premise of this order, which is that all sellers in the West should be treated similarly to remove the incentive to sell into one area versus another, so-called megawatt laundering. While I wholeheartedly encourage conservation and embrace demand reduction, we need to acknowledge that natural gas and electric infrastructure needs to be expanded and upgraded. I believe this market-oriented approach that we took in Monday's order will provide the price mitigation needed and it is my hope that it will not discourage necessary investment.

I would also like to note before concluding that I attached a concurrence to express my views about one aspect of the order that I didn't fully endorse, and that was a section that instructs the ISO to impose a 10 percent creditworthiness surcharge to the market clearing price. I believe that the imposition of such a surcharge virtually conceded to the ISO the issue of whether or not the ISO must implement our creditworthiness standards, and I thought that was premature.

And finally, I wanted to state my support for the settlement conference. You brought that up, Mr. Chairman. I am keenly aware of the difficulties that the parties face and the compromises that will need to be made to fashion a very comprehensive settlement. I have long been an advocate of negotiated resolutions and I encourage all the parties, including the State—I believe I heard the governor this morning say that his delegated officials would be parties to the settlement, and I was very pleased to hear that, and I hope that all these parties work very hard at the daunting task of settling past accounts and structuring new arrangements.

Mr. Chairman, I had a few final remarks, but I will stop there by saying that I think that all of these goals work within a market-

oriented framework and that is an approach that I have endorsed. Thank you.

Chairman LIEBERMAN. Thank you, Commissioner Breathitt. Commissioner Brownell, welcome.

TESTIMONY OF HON. NORA MEAD BROWNELL,¹ COMMISSIONER, FEDERAL ENERGY REGULATORY COMMISSION (FERC)

Ms. BROWNELL. Thank you. Thank you, Mr. Chairman, Senator Thompson.

Chairman LIEBERMAN. Do you think it was a friendly act to appoint you to the Commission at this point? [Laughter.]

Ms. BROWNELL. Well, it is full employment. I don't have any boring moments in my day, or night, I might add.

Chairman LIEBERMAN. That is for sure. Welcome. Thank you.

Ms. BROWNELL. In fact, I would like to start out by saying that I am pleased to be here and I think that my first experience in getting out this order suggests a culture at the Federal Energy Regulatory Commission that has not been largely recognized. There was a sense of urgency, there was open and honest communication, and there was innovation in the development of this order. All of my colleagues and the staff worked very hard to address a number of concerns raised by stakeholders, and I think we responded responsibly. We have created a road map to bring certainty for the next two summers so that we can all get down to the business of creating markets that work, that work for market participants, but most importantly that work for consumers.

I would like to talk a little bit today about what we experienced in Pennsylvania and what we learned, lessons learned that I think we can bring successfully to the way we do business at the FERC.

First of all, we were asked to define the differences between California and some of the States, and I think you know them well, and I do not say that judgmentally. There are just fundamentals that it takes for a market to work—good market design, appropriate capacity, an independent system operator, and I emphasize that, and sufficient infrastructure.

But while we have, in fact, had great success in Pennsylvania, there were things that didn't work and things that we needed to do to transform our Commission to successfully respond to market changes. Markets are transitional. You don't declare them open 1 day, declare victory, and walk away. They don't happen overnight. They are fragile and they need nurturing. And they need more work with the regulatory process than I would have anticipated, frankly, when we started. But they can't use the standard regulatory responses. Markets don't wait for answers. Markets need certainty. They need quick responses. People are making business decisions. Consumers are making buying decisions.

So we designed successfully in Pennsylvania several flexible approaches that I believe address the issue of transforming markets. All of our restructuring decisions went to settlement processes that took no longer than 30 to 45 days to resolve. What did that accomplish? All of the stakeholders knew what the rules were. The mar-

¹The prepared statement of Ms. Brownell appears in the Appendix on page 484.

ket participants were not exposed in the capital markets for an undue period of time. And we did not have to wait for the standard litigation process, to wait 1, 2, or 3 years. We were able to bring the benefits of a retail market to Pennsylvanians, who saved in the first 3 years almost \$3 billion. That only would have happened if we had not used these new flexible approaches.

In the early stages, we had a lot of operational issues that traditionally would have had to wind their way through a rulemaking or some other process that would have taken 8 to 9 months. We had an operational SWAT team that met, in some cases, every day in the early stages. The rules were, no lawyers, no lobbyists, no commissioners. We had a staff person who led a team of operations experts who brought instant solutions so that there were no market delays, billing problems, or other kinds of impediments to the market.

The second thing we learned was that market monitoring is, indeed, a critical issue in managing the transformation and in building the credibility of the market. It is something I think we are all learning. I am suggesting to my colleagues that we bring in some outside experts who do this kind of thing for a living. We have been rate makers. We have not been market monitors. And I think the staff is the first to say that they have worked very hard to design a system that works, but they would love some advice from the FCC, from the FTC, and from the SEC. So I would like to move forward with that because I understand that you, your colleagues, and all of our constituents need the confidence that we are going to take a good look at these markets and that there will be transparency and honesty and equity.

The third thing I think we realized and is more critical today than ever before are regional solutions. We need to reach out to the stakeholders in the regions, the States, the creation of RTOs, listen to what they have to say, listen to what their experiences are. Yesterday, we had a hearing on seams issues for RTOs and I think it made a big difference in informing us on how we must move forward. Our order called for a technical conference on technology in the introduction in demand-side management that will bring new technology to the market, I hope, as soon as we can. We are reaching out to learn things and to listen to stakeholders to learn. I think this can be very successful.

So I understand why there are concerns, but now that we have moved beyond the crisis, let us move to solutions that will work for the longer term and create the credibility and the confidence that we all need to introduce the benefits of competition to all Americans. Thank you.

Chairman LIEBERMAN. Thanks, Commissioner Brownell.

Commissioner Massey, thank you for being here. We look forward to your testimony.

**TESTIMONY OF HON. WILLIAM L. MASSEY,¹ COMMISSIONER,
FEDERAL ENERGY REGULATORY COMMISSION (FERC)**

Mr. MASSEY. Thank you, Mr. Chairman. Mr. Chairman, and Senator Thompson, our June 18 order brings dramatically expanded

¹The prepared statement of Mr. Massey appears in the Appendix on page 494.

price controls to a broken Western market. I supported the order because it adopts measures that I have been championing for the past 8 months. Price controls are now extended to the entire Western interconnection, thereby eliminating the megawatt laundering problem that has vexed the mitigation programs adopted by the Commission and the ISO over the past year. Cost-based price constraints are now extended to all hours, not just those of reserve deficiency. We have long needed 24-hour-a-day, 7-day-a-week coverage, and now we finally have it. These caps will remain in place until September 2002, giving the market two full summers to correct. I endorse these measures.

While better late than never, I wish this Commission had taken effective action sooner. Until this order, the Commission had stubbornly refused to implement full-time price constraints despite rather clear evidence that prices were not just and reasonable. Businesses have closed down, putting thousands out of work and hurting the Western economy, and all because of a broken electricity market. By acting 12 months ago, we could have prevented much of the economic carnage in the Western interconnection that has occurred over the past year, and I regret that we did not.

Given that the Commission adopted measures that I have long advocated, however, I am tempted to declare victory and let it be, but I cannot. There are some aspects of the order that I have strong reservations about. One aspect is the addition of a 10 percent surcharge to the market clearing price to reflect credit uncertainty. I do not see the need for this. The Commission has issued orders in the past few months instructing the ISO to abide by the creditworthiness requirements of its tariff. I am concerned that the adder may diminish the ISO's enforcement of those requirements. Moreover, it is my understanding that, recently, all sales into the ISO markets have been backed by a creditworthy party—recently, all sales, not until recently.

Instituting this surcharge does have a modest bright side, however, I must admit. Generators may no longer attempt to justify bids on the basis of credit risk above what is provided for in the cost-based clearing price methodology. This was a major flaw in the old, ineffective \$150 benchmark in our earlier mitigation program announced in December. Eliminating that ground for high prices is a positive development.

Second, the order should have provided guidance to the parties that will participate in this massive settlement conference that we order. I believe we are avoiding our responsibility under the Federal Power Act to set just and reasonable prices by requiring parties to settle a multitude of issues with a price tag of billions of dollars without at least 2 cents' worth of guidance.

Third, I do not agree with the rhetoric in this order that characterizes cost-of-service pricing as irrelevant and perhaps even downright harmful on the theory that it would discourage new supply. I do not understand the need nor the logic of this language. We have made a choice in the order to strike a balance between strict generator-by-generator cost-of-service regulation and a blind reliance on the market. The mitigation program puts in place important cost-based price caps while relying on market-based pricing. The order sets out reasons for this balanced choice and articulating

them is all that is needed to support our decision. Make no mistake, this is a cost-based program. The maximum price is limited to the costs of the last generator dispatched.

I strongly disagree with the statement in the order that a cost-based inquiry alone would not be sufficient to fulfill our statutory duty under the Federal Power Act. I do not read the Federal Power Act and the relevant court decisions so restrictively. I have aggressively supported this movement to markets, and I still do, but there is still an important role for cost-of-service regulation where markets melt down and prices are not just and reasonable.

What is curious about this aspect of the order is that the concern is to avoid discouraging new supply. However, as well respected economist Alfred Kahn recently said of our long reliance on cost-of-service regulation, and I believe he said it before this Committee, "If the literature agrees on anything about that experience, it is that cost-based regulation as traditionally practiced has encouraged the gold-plating of service and the very excess capacity that seems to promise such enormous benefits to consumers during the past decade if rates were deregulated."

Mr. Chairman, I notice the red light is on. May I have 2 more minutes, please?

Chairman LIEBERMAN. Indeed. Go right ahead.

Mr. MASSEY. Thank you. Dr. Kahn, therefore, believes that cost-of-service regulation may lead to too much supply. Thus, I do not understand the order's logic concerning cost-based regulation discouraging supply adequacy. There may be legitimate reasons against cost-based regulation, but discouraging new supply is not one of them, at least according to Dr. Kahn.

These concerns notwithstanding, I supported the order and the price protection plan it puts in place. To ensure that this price protection plan is successful, the Commission must exercise all of its statutory powers to keep natural gas prices in the West at just and reasonable levels. Virtually all of the formula, all of the formula except a \$6 O&M adder, is tied to the cost of fuel. For the marginal unit, that will be natural gas. Thus, the success of the plan we adopt in lowering prices depends in large part on fluctuations in the price of natural gas. If natural gas prices stay reasonable, our plan will provide reasonable price mitigation.

Today's price protection plan gives California and the West breathing room while the markets are brought back to health. A number of items need to be addressed in the next 15 months. There must be substantial amounts of new generation capacity brought on-line, a more balanced supply portfolio must be developed as California moves away from over-reliance on the spot markets, a robust demand response program must be implemented through demand bidding and accurate price signals, the transmission constraints must be relieved.

Without these measures, which must be implemented over the next 16 months, I would be concerned about whether the markets in the West can be brought back to health. Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, Commissioner Massey. And finally, Commissioner Wood, welcome to you.

**TESTIMONY OF HON. PATRICK H. WOOD, III,¹ COMMISSIONER,
FEDERAL ENERGY REGULATORY COMMISSION (FERC)**

Mr. WOOD. Thank you, Chairman Lieberman and Senator Thompson. I would just ask that my written comments represent my views here. I am the fifth guy of five, so I won't belabor you other than to say, from my own experience as a State regulator in Texas, I share a lot of Commissioner Brownell's perspective on these issues and recognize that it is so important that the Federal Commission be perceived and be in reality a co-player in regulating these very important infrastructure industries, electricity and natural gas.

One of the important aspects of competition, the only reason that competition works, and as we have seen the counter case in California, is that there are good market rules in place and a sufficient infrastructure, infrastructure being a broad word, meaning supply side and demand side, resources meaning the delivery that gets them there, whether that be gas transportation pipelines or electric transmission lines. It doesn't work well—it doesn't work at all if the infrastructure is not in place.

I think one of the lessons learned by this Commission is that our historic reliance on individual States or on private industry organizations to oversee that sort of reliability is, I think, a thing of the past. I do think that is a role now that clearly ought to move to this Commission and ought to be a constant oversight for us as we determine that the competitive infrastructure is in place before we move to a deregulated era.

So that is what I hope we will do. I think we probably are going to need some resources to do that and we will be, I think, reviewing that in the appropriate way with the Chairman and with our oversight committees, as well.

But in addition to people and financial resources, I think also one of the things that are important for regulators to have are big sticks, not that they ever need to be used, but when they hang from your belt, the people who you are trying to regulate understand. Certainly, the ability to revoke a certificate, or as my colleagues here recommended, at times to go from a market-based certificate to a cost-based certificate may be perceived as a penalty of sorts. I think administrative fines, certainly ordering refunds is one issue, but to order refunds with an administrative penalty attached to those would be perhaps a useful tool for the Commission to have in its tool shed.

I think perhaps we were asked if there were treble damages, much as exists in antitrust lawsuits. We found that we did not have the statutory authority to do that in this order that was issued yesterday, but that again may be an important tool for the Commission to have. Those do not exist today, but I think if we are going to be a vigilant market cop, we need to make sure that our bite can match our bark.

So I look forward to working with you, Chairman Lieberman, Senator Thompson, your Committee, Committee staff, and my colleagues on making sure that this Commission is fully equipped to do the job that I know you want us to do well.

¹The prepared statement of Mr. Wood appears in the Appendix on page 504.

Chairman LIEBERMAN. Thanks, Commissioner Wood, for that statement, very interesting statement.

I have been thinking as I have been listening to the testimony today. This picks up a thought that you just articulated, which is that the market is a magnificent mechanism for stimulating, facilitating economic growth, thereby general well-being, and through competition getting people the goods or services they want at the best possible price.

I am paraphrasing somebody, maybe famous, maybe not. The market, notwithstanding its great attributes, its positive attributes, has no built-in conscience so that if there is not genuine competition, then there arises in a market without the pressure of competition, the genuine need—you just uttered the word, for what I would say a cop on the beat, to bring back the conscience, to bring back a sense of right and wrong, and limits. Otherwise, people will suffer.

And I do think in the environment we are in now, both in terms of deregulation of certain elements of the energy industry and then more broadly the grave national concern about fluctuations in energy pricing, that this is a role that various agencies and departments in the Federal Government have to play. And I appreciate what you said. I think that there will be a way in which this Commission, I hope, has crossed a bridge to a new chapter in its history through this period of time. So I appreciate what you have done.

As I said this morning, I think the order that was issued on Monday was a real step forward and I appreciate it. I have some questions about it, both in terms of the formula chosen and the means chosen as well as questions about refunds which, in part, Mr. Hébert, you answered.

But let me go to the formula. Once you decided last December that the rates in California were not just and reasonable, and I gather on Monday in the order made the similar decision for the rest of the Western grid. The question then is what relief to provide.

I am from a State Government background. I was Attorney General. My office represented the Public Utilities Commission, control authority as we call it in my State. So the notion of a cost-of-service-plus—some reasonable profit seemed much more simple and certain, and I suppose easier to administer to me.

As I look at the system you have chosen, I want to ask this question. It seems to, as one of you said, peg the acceptable price in California to the last price offered during the period of time, the highest price, and, therefore, arguably the least-efficient price, the least-efficient company setting the price. Then they can charge up to 85 percent of that in the off-peak hours.

So there is no question that this system will impose some constraints on pricing to the benefit of electricity consumers, energy consumers in California and now throughout the West. But considering that the standard of law is just and reasonable rates, how can you feel comfortable that this system will guarantee just and reasonable rates? In other words, you have put on a ceiling here, but because it is being set by the highest price, the last price charged, the highest price, it can be a pretty darn high ceiling and

there still can be a lot of latitude for unjust and unreasonable pricing underneath that ceiling.

Mr. HÉBERT. Let me speak to that as quickly as I can, and that is really the crux of what we are trying to accomplish here. One, and I know you understand this, while we were trying to put this together, our goal was to bring prices to a reasonable level while at the same time attracting adequate investment so we can get the supply there, we can build the deliverability up so that we can deliver that supply, therefore keeping prices down in the long term for consumers.

We weren't really looking for the easiest way to get there. We were, in fact, looking for the best way to get there. I think that is what this plan is.

I have heard many people on this Committee, Mr. Chairman, I have certainly heard you speak on green issues and making certain that we have a green environment. Through driving the efficiency, we do two things. One, we bring down prices. Two, we strive to never make our air dirty through bringing in the cleaner units. If the most inefficient unit that clears the market is setting the price at which other people may take, then you are going to drive everyone's efficiency, and the secret is this. As they enter the bid stack, no one knows which units are going to be called and which is going to be the last unit, so there is no way to predict or manipulate which is the most inefficient unit and which one is going to be called last.

There would be some people who would suggest, well, it is going to keep the dirty units on for the long term. Well, that is not true, because if they are what is clearing the market and if their costs or their market inputs is what is setting that price, then their profit is much lower than anyone who has got a 7,500 heat rate system as opposed to a 40,000 heat rate system. So what they are trying to do is, hopefully, we will retire these dirty systems. They will go away. We will bring in the newer 7,500, and even under compressed situations, 4,500, heat rate systems. They will be much more efficient and they will clean the air.

Now, that is better for consumers in two aspects and it meets the balance of bringing prices to a reasonable level while at the same time attracting investment and providing for clean air.

Chairman LIEBERMAN. Let me ask you and any other commissioners who want to respond, why is that better than having gone to a more traditional cost-plus-reasonable-profit system, such as has existed traditionally at the State level?

Mr. HÉBERT. I will give you the brief answer and I would like to give each of my colleagues an opportunity to answer it. One, we have come up with a plan that I think we are going to be able to move forward with as we move towards cost-based. We have seen the litigious nature of that, the appellate review of it, the indecision that ever comes from it. We need something. California and the West needed immediate results. They needed a problem solved today. Cost-based does not do that.

And the other thing that cost-based does is it does exactly the opposite. It would guarantee a profit at maybe 10, 12, or 13 percent return on these inefficient units and you would keep them around a very long time and we need those units off.

Chairman LIEBERMAN. Do any of the other commissioners wish to respond? Yes, Commissioner Breathitt?

Ms. BREATHITT. Mr. Chairman, I would like to make a point, that this plan is only covering 20 percent of the electricity sales occurring in California. The number that we have gotten from State officials in California is that they have been able to secure 80 percent of their sales in fixed price contracts. So we are only talking about this plan mitigating prices for 20 percent of the energy purchases, and I think that is an important factor. It is not 100 percent.

The plan also is a market-oriented plan that has incentives as we believe that will incent new investment, but at the same time, you can call them price caps, you can call them price controls, you can call them a price mitigation, it does put in price controls that have proven to be effective from our March 29 order, and if this continues to hold forth, it is going to be effective all hours, all the time.

Chairman LIEBERMAN. I do want to note for the record that two of you have used the term "price control." I was expecting Groucho's duck to come down from the ceiling. [Laughter.]

Ms. BREATHITT. I will say price cap.

Chairman LIEBERMAN. You are truly bold.

Chairman THOMPSON. I wish the governor had stayed around to listen to this. He ought to be here.

Chairman LIEBERMAN. Commissioner Brownell, do you want to add anything?

Ms. BROWNELL. I will try and dodge the issue of calling it anything as long as it works, frankly.

Chairman LIEBERMAN. Yes.

Ms. BROWNELL. I would add simply that I think it is pretty clear from other markets that you do not get innovation when you have monopolies and cost-based kinds of pricing, that the kinds of opportunities that capital flows to are created by markets where people can make economic choices and to make choices based on other kinds of preferences. We saw almost 20 percent of the market in Pennsylvania choose green power. For the first time, we actually had investment in a number of green plants, many examples of economics that work, but an example, I think, that will prove true over time.

I also think that the commentary by the investment community yesterday and this morning would indicate that it also satisfies some of their concerns, so you will have stability both for the incumbents to the extent that they deal with their other issues and the market players. I think that is important, as well.

Mr. MASSEY. Mr. Chairman, my preference was to return temporarily to a system based upon the cost of each individual generator in the market. I think that would have been a more effective time out and I would have exempted any new generation from that. I hope my colleagues are right that a cost-based system tied to the least-efficient generator will actually encourage the retirement of those generators. A lot of economists believe that it will. Others believe that it may provide an incentive to keep some of those old dogs around so that the market clearing price can be pegged rather high.

So I don't have 100 percent confidence that this is the right approach, but it seemed to me that it was a dramatic step forward.

Chairman LIEBERMAN. Commissioner Wood, I thought I heard you say in your opening statement that you have left the door open to situations where the Commission might want to temporarily order a cost-of-service-plus rating system.

Mr. WOOD. I think that is always an option, Senator. Some perspective on this. The State in 1996 put forward a plan that FERC approved that said they wanted to move away from it as part of their restructuring plan. The Commission, wanting to work with the States, in fact, approved that. That moved the procurement of almost all the power by the major investor-owned utilities to the spot market mechanism where you take the last unit's price.

Back in that day of surplus and prior to the drought, that incremental unit was cheaper than the average unit, and I think had that world continued for forever, people would have continued to be better off under the deregulated plan than the regulated plan. But the drought, which hydroelectricity is a big part of the energy picture in California and in the Northwest, the drought and the lack of investment in anything new caught up with the State and with that region last summer, and in the fall, the Commission moved in its December order to really preempt the State plan and say, this will not work anymore. We have got to get you guys out of the spot market and move you to a contract-based market. So that is when, as Commissioner Breathitt pointed out, we are now down from 100 percent to 20 percent of the power plants playing in this hourly marketplace, and so that has meant quite a bit of difference.

As I mentioned yesterday, and I am sorry I do not have my crude drawing skills as at the Energy Committee, but in response to Senator Feinstein's proposed legislation with Senator Smith, what we have found is that the units that are playing in this spot market pool are largely the older gas-fired plants, we call them the old dogs, and they are largely about the same heat rate. They are about the same level of inefficiency.

So because of that unique situation, it seems to me that cost-of-service ratemaking in that spot market might actually cost the customers of California more than what the Commission adopted. Now, that may not always be the case, and it is a tool, as your question asked, Senator, that is a tool in the regulatory toolshed, that if a cost-of-service rate is the best way to get to a just and reasonable rate, it certainly is in the statute and it is certainly something the Commission can do. I do think for the reasons stated that it may be advisable to move toward ones that are more incentivizing than we have had in the past.

Chairman LIEBERMAN. Thanks. My time is more than up. I appreciate your answers. I think I understand better why you made the decision you did on Monday.

I must say that I am left with a question about whether the system you have chosen will ultimately fulfill the statutory responsibility to maintain just and reasonable rates, but I think the answer to that is that we are not going to know until we see for a while how this system you have chosen works. So we will all, hopefully, be following it with open minds and learn from the experience.

Senator Thompson.

Chairman THOMPSON. Thank you, Mr. Chairman.

I appreciate the Commission being here and the work that they are doing. I imagine you feel somewhat like a center on a football team. Nobody notices much what you do until something goes wrong. But I think people are beginning to realize more and more the work that you have been doing, the 50 to 60 orders that you have put out, the addressing of this issue. Just because you do not do what people want you to do, one side or the other or both, does not mean that you are not addressing the issue. I think, if nothing else, you have disabused the two extremes, and these are the people who say that FERC has no role in this and the others who say all you need to do is cap retail prices and wholesale prices and prices will be low and everybody will be happy.

So, hopefully, we have moved away from both of those. I think one thing that we have learned is that if we have prices that wind up driving the demand up and the supply down, you are going to have problems. And we can't just look at the problem today and what we do about it in the short run because we run the risk of exacerbating an already troublesome situation.

It does seem to me like this is, in many cases, short-term versus long-term consideration. Something that might be helpful in the short term and pleasant, or more pleasant, might not be the right thing to do in the long term, and those are the balances that you have to make. I think the more we learn about it, the more we see the complexities of it.

I do not think, for example, you can talk about the March order and whether it is successful or not. Until we get a way down the road, you may have gone not far enough, you may have gone too far. I don't think anybody knows. I mean, that is the nature of the situation, and especially the nature of electricity, it seems to me. If there was an answer—we have brilliant people here now for the second day on both sides of the issues. If there was an answer, we probably would have discovered it. So we have to do the best we can and learn as we go along.

One of the things that puzzles me is what are we going to do, and I know the tremendous pressure that this Commission has been under, but the Department of Energy, Senator Murkowski testified today and he pointed out that the Department of Energy has pointed out that, as I understand it, that there will be black-outs in California. Now, you know what is going to happen. There is going to be a hue and cry that the Commission didn't go far enough. That will be definite proof that the Commission didn't go far enough, and the pressure that you see today will be magnified many times over.

My question is, what are you going to look at? I know you are not going to just respond to the public opinion polls. What are the factors that you will look at when that happens? Are you going to look at what has happened since this order and conclude that that can tell you what the sound policy is for the future, or will your analysis at that point be the same analysis that you have today. That is, you consider all of the factors that you ought to consider and you put this down for time enough to see whether it works, however long that might take.

But it seems to me that from a, I do not want to use the word “political” standpoint, but that is something we have to consider if you do not, but you are buying into a tough hand here because you are coming up with a policy in your considered judgment—some of you have some reservations about it, but in your considered judgment is the way to, knowing that if it works as well as it can possibly work, you are going to have blackouts. How are you going to handle that when the time comes?

Mr. HÉBERT. Senator Thompson, I will tell you that you are exactly right as to the politics and the pressure, there has been a lot of pressure applied by the Senate and the House and State leaders. The important thing is that this is an independent agency, hopefully not susceptible to pressure. I want to thank my colleagues for taking a bold move by believing in this and saying we believe this will work.

We cannot, “we” being FERC, control blackouts. It is outside the realm of our ability to change. The reason for that is we can’t site generation. We can’t build generation. We can’t cite intrastate gas pipelines that supply fuel that, quite frankly, is constrained right now in California. There are things that are outside the realm of opportunity for us, and that means we need help and we need California to help.

We will just have to continue to believe in what we need, and that is to call balls and strikes. Part of the beauty, I think, of this Commission of five, Commissioner Wood brought it up about two State Commissioners. Actually, you have four State Commissioners, previous State Commissioners, I think three of which, including myself, that were previous chairmen of State Commissions. So we are sympathetic to the needs and plight and understand the political pressures that are on State leaders, as well, in this regulatory environment.

There are mechanisms that we are going to continue to pay attention to. This plan stays in effect through the end of September 2002. There have been lots of questions come up, is that long enough? How long should you go? Well, the end of September is an educated guess based on what we are being told is going to be brought to the marketplace in California and the West as far as generation.

Now, there was a release in April of this year by the State of California, perhaps it may have been the governor’s office, I can’t recall, that there was going to be around 5,000 megawatts brought on-line by the end of this summer, which is very important to this Commission and certainly important to the people of Commission.

Chairman THOMPSON. By July.

Mr. HÉBERT. Right. The newest numbers that are out are suggesting to us that 2,309 megawatts are going to actually be what is going to be what is on-line. That is less than half of what we are told. If those megawatts are not brought on-line, the blackouts will continue and they will be harsher because demand is increasing. We have no control over droughts. We have no control over outages, although we are trying to inject ourselves there to make sure we understand the schedules.

The short answer is, I don’t have an answer for you, Senator Thompson. I wish I could tell you that politics are not going to play

a role in this and I wish I could tell you that I know and I am willing to bet my life on this plan. This is an evolution that we are going through. We are learning this process. I think right now it is the right move and I believe it will bring down prices and at the same time bring in new supply. But I remember when I got this job on January 22, the California crisis was right in the middle of our face and I was asked about it by some reporter, "What are you going to do about it?" and I said, "Well, we are going to work hard and we are going to be committed. I did not start this fight, but I am going to try to finish it." And that is what we are doing.

Chairman THOMPSON. Does anyone else have a different observation or additional—Mr. Massey?

Mr. MASSEY. Senator, my view is that this order does about all that we can do at the Federal level, this order and previous orders, to prevent blackouts this summer. The ISO is skillful and has adequate tools to keep the system in balance if there is enough supply. There is a "must offer" provision that requires all generation in the Western interconnection that is not committed to native load or wholesale contracts to be offered in every hour of every day. The ISO in California will supervise maintenance schedules and outages within the State to ensure that the maximum supply is available.

We have, by imposing these price controls, I think, eliminated any incentive to withhold generation to drive up price. That strategy is simply not available anymore because it won't work. So that is about all we can do.

There will still be blackouts this summer in California because there is just not going to be enough supply in some hours, and I am not sure what this agency can do about that at this point.

Chairman THOMPSON. Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, Senator Thompson. Senator Collins.

Senator COLLINS. Thank you, Mr. Chairman. Mr. Chairman, before I question our witnesses this afternoon, for the honor of my State, I have to correct a wrong statement that was made this morning by Senator Torricelli after I had left. It is my understanding that the Senator from New Jersey made comparisons about Maine's per capita energy use versus California and implied that Maine was much higher. That is incorrect, which does not surprise me. And I would also note, though I am sorry he is not here to hear this, that the residents of New Jersey use 35 percent more electricity per household than do the residents of conservation-minded Maine.

I thought it was very important for the record that I set that straight, and I would ask unanimous consent that a table doing a State-by-State comparison of average monthly bills be included in the record.¹

Chairman LIEBERMAN. Without objection.

Chairman THOMPSON. How does Connecticut fare? [Laughter.]

Chairman LIEBERMAN. Actually, I think we do pretty well, don't we? You don't have to give me the answer now.

¹The chart entitled "Average Monthly Bill By Sector," appears in the Appendix on page 744.

Senator COLLINS. I am sure that you would be interested in that—

Chairman LIEBERMAN. The thrifty New England Spirit.

Senator COLLINS. That is right.

Mr. Chairman, I very much appreciate the opportunity to discuss with our FERC Commissioners this afternoon some issues that are of great concern to the people of Maine, and since I have been in touch with many of them on the issue I am about to raise, I am sure it will not be a surprise to them.

I first want to congratulate the two new members, Commissioners Brownell and Wood, on their recent appointment and tell you that I checked you out with the members of the Maine Public Utilities Commission, on which a former counsel to me serves. They speak very highly of you and I am confident that coming directly from State regulatory commissions that you will be especially sensitive to how your decisions affect consumers, particularly those who have little or no control over what they pay for electricity.

I would like to pose some questions about the charges for installed capacity, the so-called ICAP fee, which has been a very controversial issue in my State. I realize there may be some limits on your ability to respond, and I will respect those limits.

To provide some background to my colleagues, Maine leads the Nation in the percentage of its electric load served by competitive providers with numbers that recently passed those for Pennsylvania and that continue to grow. Unfortunately, what appears to be good news on the surface is the result of a less-happy development, mainly that our consumers pay very high prices for standard offer or default service. This is because of the interest in promoting competition. We have done more than any other State to expose our consumers, especially our business consumers, to current market prices for power. That obviously contrasts dramatically with the approach taken in California.

And it is a tribute to the people of Maine that they have largely accepted these price increases with stoicism, if not silence. But it would be unfair and unwise to abuse their patience with additional government-imposed costs that cannot be absolutely justified. The market is already making them pay dearly for energy, and in my judgment, the Federal Government should not be adding to this burden through high capacity charges.

I appreciate the importance of providing incentives for new generation, but unlike California, it is difficult to see that New England has any kind of problem on that front. More significant, we should be very careful that in our eagerness to create incentives for new generation, we do not want to create incentives for voters to pull the plug on electric competition.

Against that backdrop, I have two questions. First, to what extent has FERC considered the appropriateness of using a deficiency charge for capacity that was developed during a time of fully regulated, vertically integrated utilities in a time when power is sold in a competitive market? To be more specific, in the prior world, utilities sold each other energy based on their actual costs. Most owned substantial generation, and government could ensure that the proceeds of any capacity charges were used for new construction or otherwise benefitted consumers.

Now in States like Maine, energy prices are based on what the market will allow. Companies that sell power to consumers often have to buy all of their capacity in the market and capacity charges are simply another cost imposed on consumers with no guarantee that they will be used to improve reliability.

Should these dramatic changes in the nature of the industry alter how FERC sets deficiency charges for capacity and how the proceeds are allocated, and if so, how? Mr. Hébert.

Mr. HÉBERT. You are well-educated on an issue that you should not be required to be educated on.

Senator COLLINS. I agree with that. [Laughter.]

Mr. HÉBERT. I want to remind my colleagues that this is a pending matter. This is a remand back to us from the First Circuit, so, therefore, we have jurisdiction of it at this point. I would ask the Senator's permission to very carefully draft you an answer in writing as opposed to giving you anything orally that may cause me to recuse myself. That is a pending matter. Mr. Welch and I are friends, as well, and I hear you, heard him, and we will be acting.

Ms. BREATHITT. Senator, I think that is why you saw us all sort of shifting back and forth and talking among ourselves. We have had this before us for a while. It went to the court. The court remanded it back and I hope we will be acting soon.

Ms. BROWNELL. Senator, I would just like to add that you asked the right questions. The questions are not only being asked in New England, but in PJM and throughout the country, both by the market participants and the ISOs. So it is an issue that we will be dealing with and I think we are cognizant that a transforming market requires new looks at everything.

I would also like to suggest it would be a great thing if you could lead a conservation competition among all the States. It would be the fastest way to get demand-side management to the market that I could think of.

Mr. MASSEY. Senator, I have no idea whether we got that \$8.75 charge right or not. I think our decision was reasonably well motivated. We want load-serving entities to come to the market meeting their requirements plus some measure of reserve, and if they fail to meet that reserve capacity requirement, the question is, how do you create incentives for them to meet that capacity reserve requirement and should they be penalized if they fail to meet that requirement? That is really what this is all about. And if they should be penalized, what should the level of penalty be? That is what is before us.

The Court of Appeals said to us, you can retain the \$8.75 per kilowatt month penalty if you choose to, but if you choose to, you have to provide a much better explanation of why you made that choice, or you can move off of that choice. We now have before us a new proposal from New England about how to calculate that fee, and I won't comment on the wisdom of it because I haven't reviewed it, but I know it is before us.

But I do think one of the issues this Commission is struggling with generically, and frankly, it rose out of the California debate, there was no capacity market in California and no reserve requirement and not enough generation being built and—

Senator COLLINS. But New England is not California, and that is part of our—

Mr. MASSEY. That is true, but one of the reasons New England is not California is there is this capacity requirement, and the question is, if the load-serving entities don't meet it, to what extent should they be penalized? That is really the issue before us. I am sensitive to your concerns. I am glad you raised it and we will try to do the right thing on rehearing.

Senator COLLINS. Mr. Wood, did you want to add anything?

Mr. WOOD. I think, as kind of a general matter, because this was really the last piece of unfinished business on the agenda when I left the Public Utility Commission of Texas, which like New England and unlike any other place in the country both have in excess of 20 percent excess capacity looking at this summer and next, one would think in a market-based scenario, in a market that is slightly overbuilt, that the costs of buying social insurance for excess capacity would be relatively low, if not zero. In a market that is really tight, if you were buying social insurance for capacity, like in California, maybe that would be a relatively expensive purchase.

So philosophically, the answer to your question is that a market would price things different than a regulated area. How it does so is going to be, again, subject to this proceeding that is coming up. But I think it is a critical question to get right, because as I mentioned before, relying on external sources to make sure we have enough capacity in future years is something that the Commission can no longer do. We have to ensure that mechanism is something that is ordered by this Commission, if it doesn't already exist.

Senator COLLINS. Mr. Chairman, I am wondering if you would indulge me with one more question—

Chairman LIEBERMAN. Go right ahead.

Senator COLLINS [continuing]. Since it involves New England.

Chairman LIEBERMAN. That was a very craven appeal to my partisan, or my regional, parochial, regional interests. There are only three of us, so you should see the red more as a cautionary yellow light.

Senator COLLINS. Thank you. [Laughter.]

My second question is this. The independent system operator of New England recently submitted a proposal to FERC which provides that sellers of capacity must agree to bid their energy into the market at a price that is capped at \$1,000 a megawatt hour. I earlier talked about a situation we had in New England last May when there was a price spike that went to \$6,000 per kilowatt hour, more than 100 times the usual rate.

I won't ask you to comment on the specific proposal, because I understand the constraints you are under. But in general, should a generator who receives capacity payments have any limits on the prices that it charges for energy? Mr. Hébert.

Mr. HÉBERT. As you know, we do have a matter pending before us and, therefore, I am going to be precluded from answering that. I will tell you that this Commission, I think, has been very clear that we are conscious of rising prices, we are conscious of problems that markets that are not fully designed and fully functioning create, and that we are willing to do what is necessary to make certain that those markets are working and on their feet.

Senator COLLINS. Let me ask just one final question that is not related to a matter that is pending before you. But I have to tell you that those matters that are pending before you are of extraordinary importance to my State and have caused a great deal of consternation, and whenever I go to a manufacturing plant, it is the first issue that comes up. In fact, you would not believe the number of people in Maine who know what ICAP means. That is really frightening.

Let me switch gears for a moment. It seems clear to me that given the short-term inelasticity of electricity markets, that there are periods when at least some sellers can know with certainty that their output will be purchased no matter what the price. Now, during these periods, what steps do you think we can take to constrain prices—I know the \$1,000 cap has been one approach—that will preserve public confidence and still provide sufficient incentive for capital investment in generation?

And one particular matter I would like you to comment on, in addition to price mitigation or price caps that could be imposed, is whether or not we should be looking to develop a real-time demand response, and whether you have any thoughts on how such a response could be incorporated into the market structure. When we had that \$6,000 spike, consumers didn't know that at that time they should turn off their air conditioners or delay doing laundry or curtail their use of electricity. They don't have any way of knowing when we have hourly electricity markets what the prices are for that particular time. Mr. Hébert.

Mr. HÉBERT. Actually, what the Commission has done is we certainly, I believe, have a full understanding that we have to be committed to a wholesale marketplace that works. What you are talking about is fluctuations in a marketplace from time to time that get price spikes.

I will tell you, individually myself, not speaking for the entire Commission, I understand price spikes, but what consumers truly feel are average prices. A price spike every now and then may give some certainty to the investment community as to where they need to send their dollars to invest, to build new generation, perhaps to deal with congestion or bottlenecks.

Through our Order 2000, this Commission believes that if we set up regional transmission organizations, which we are in the middle of right now, we can somehow get the free flow of electrons. The end state hopefully will be flow-based rates that will give us some opportunity to make certain that all consumers get the benefits of a market that works. We are not there yet. We are in the middle of that process. It is a part of the evolution, but we are continuing to go down that road.

We are working with State regulators. I mentioned to you Mr. Welch. We are trying to make sure that all State regulators understand the need in us working together with the regional transmission organizations to get these grids to work. Ideally, we would love to have one North American grid. That is not going to happen. We have got the interconnection difficulties, but we are trying to get it down to a lower level than we have currently got. We need investment in infrastructure. We need investment in supply. And the Order 2000 will bring about that, I believe.

Senator COLLINS. Commissioner Breathitt.

Ms. BREATHITT. Senator, I would like to add that if there is sufficient supply in your area, in your State, that that expensive bid for power may not ever be needed to be called upon by your grid operator. So one thing that can be focused on in your area is if there is the right planning process to site new needed generation, and because of the installed capacity program in your area, there should be the incentive in place to ensure that there always is a reserve margin.

The other thing that is in place in the area that Commissioner Brownell comes from, and we have seen it in ISOs to the north, Pennsylvania, New Jersey, Maryland, is the circuit breaker concept that you mentioned of \$1,000. The few times it has been used in the PJM control area, I think we asked recently and they have only gotten up to \$1,000 under six times. So it is rare that it gets up there, but it is a circuit breaker if sales do reach it. So adequate infrastructure, climates that allow for that, and a circuit breaker approach works.

Ms. BROWNELL. Senator, I would simply add that another issue is you have to have the rules in place that make sure you know what is going on in that market and why that spike took place, and you have to have appropriate things like congestion pricing that is responsive to the market. So I think those are things that we are working on and they are important. We do have a \$1,000 cap in PJM and I think it just sends a signal. But critically, you have to know why that spike was there.

On demand side management, in our order on Monday, we called for a technical conference in two phases. The first phase will actually bring in technology providers—it is really extraordinary what is out there—and learn what is available, and then in the afternoon probably talk about implementation issues.

The reality is, I think customers are a whole lot smarter than we think they are and I think if we can encourage the development of technology, we can bring down costs and let everyone from large business to small business to homeowner begin to use the tools that are available. So we are committed to doing that and we do understand that is a reality, an important reality, in any market.

Mr. MASSEY. Senator, I think it is a wonderful question. You have really put your finger on an issue that I think we have grown to believe is extraordinarily important in any electricity market. Electricity markets aren't like other markets where a purchaser simply decides not to purchase if the price gets too high. In other markets, that has a substantial price dampening effect, as you point out. But in electricity markets, we simply don't have that yet, but we are working on it. It requires, I think, a strong Federal role and an even stronger State role to make that happen. But because of the nature of electricity, I think it is important that price volatility be minimized to the extent possible. It is simply not acceptable in electricity markets.

We need to implement demand response programs, working with State Commissions. It will require a substantial portion of the load actually seeing a price signal in real time, I think, having the tools to respond to that price signal to cut back on usage. I think the technology is available to do that. This conference that Commis-

sioner Brownell played a leadership role in establishing, I think could be a watershed event in this Commission moving forward to understand the relationship between the wholesale markets and the retail markets, particularly as they relate to the demand side, so I very much appreciate your question.

Mr. WOOD. I guess the only thing I would add, Senator Collins, is that unlike buying gasoline or milk or a new car, you get a bill 30 days later and it is a little hard to change your behavior because it has already happened. The big customers tend to have real-time meters on their premises, and when, as we move to hourly markets, as you all have in the Northeast, hourly prices are then corroborated with the usage of the plant, the manufacturing plant that you mentioned in your question, that those folks are pretty cognizant of what the prices are, as you know, and have the ability to respond to them.

Actually, 30 percent of the market, which would be the commercial and industrial, the large guys, if those people have the ability to react in real time by cutting off their power usage in whole or in part and getting paid for it, which is what the demand side mechanism that Nora and Bill just talked about are all about, i.e., if you are going to pay \$6,000, I will take \$3,000 to shut off. This guy will take \$2,000. This guy will take \$1,000. We will get down below that \$1,000 cap pretty quick. These people will take some money to get shut off. Interruptibility has a price. Then that really becomes another player in the market, just as good as building a new power plant.

So it is a critical silver bullet to solving this market-based transition that we are in and I am glad to hear you are interested in it, too.

Senator COLLINS. Thank you. Thank you, Mr. Chairman.

Mr. HÉBERT. If I might add one thing on the demand side, Mr. Chairman—

Chairman LIEBERMAN. Sure.

Mr. HÉBERT. Senator Collins, a couple of things. The demand side issue is something that has certainly been in front of FERC, that we have been engaged in. Actually, the first time I think we supported it together was March 15. We had it in our March 15 order. We had it in our April 26 order. And now, the 5-0 vote of the Commission the first time we have been able to get together on it.

But I will tell you, understanding, and this is, again, where I think it is important to have four former State Commissioners engaged in this, the demand issues are State issues and they extend beyond our jurisdiction here at the FERC. But what this Commission, through removing obstacles and impediments, is willing to do is complement the services of States that are willing to get into demand issues. We are willing to help them when and where possible in looking for ideas and answers. Thank you.

Senator COLLINS. Thank you very much. Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thanks, Senator Collins.

I have a series of questions about the order on Monday, just to clarify on some questions that have come up. The first is on the question of refunds, which there was a lot of concern about this

morning. I think I understand, Mr. Hébert, what you established and what your understanding is regarding the California—the 15 days before the administrative judge—parties will discuss the settlement, the judge has 5 days or 7 days thereafter then to recommend to the Commission, and there is some latitude there to begin a process.

You also indicated, I was pleased, that there is some way in which Oregon and Washington can become parties to that process. Additionally, those two States expressed a concern, and the letter that I mentioned before is from the four Senators from the States, Senators Wyden, Smith, Murray, and Cantwell, to the Commission, which undoubtedly will be waiting for you when you return.

The question is the law and the fact that they need to wait 60 days after the investigation is opened to enjoy any benefits of refund, which would not in this case, in their case, occur until early in July of this year, and that is the law. Because that seems like an inequitable situation to me, and my question is, is there any way to work around that within the law?

Mr. HÉBERT. I like that question.

Chairman LIEBERMAN. The reason I ask that is—

Mr. HÉBERT. As a lawyer, I love it, but—

Chairman LIEBERMAN. The Attorney General of Washington suggested that if there is not, one of the things the Committee ought to do, working with the Commission, is to see if we cannot find a way to change the law, and I do not mean with regard to these cases, but in the future.

Mr. HÉBERT. Well, obviously, the Federal Power Act is the law that we go by in regard to this, and certainly Congress can amend and change and whatever law is passed down to us, we will follow. We have to follow the law and that is what we are doing.

Sixty days after the notice is exactly right. That is why it is July 2, and I think that is the case you are talking about. As I told you, there is a pending matter before us in dealing with Puget Sound and we will have to be very careful in any comments we make due to that, because I nor anyone else wants to be recused. We all want to sit on that case.

But I will tell you at the same time, as I shared with you a little bit before, I think that is the beauty of the settlement process that we set up through this order that we issued on Monday, and that is that there are entities from the Northwest, the Pacific Northwest, that are parties to this California settlement.

Chairman LIEBERMAN. Because they are suppliers into California.

Mr. HÉBERT. And I will tell you that we have, I believe, one of the best settlement judges around, our chief judge that is going to handle this matter. Now, this Commission felt it was important to leave the uncertainty there. What this judge ends up doing within the confines of that hearing room, I don't know nor can I give direction to, legally or ethically. But I will tell you, I believe that is the beauty of the settlement process.

My guess is that through this settlement process, there are many issues within our jurisdictional grasp—"we" being FERC—that will be settled. As with most settlements that I have ever seen or been a part of, my guess is there are some issues that are outside of our

jurisdictional grasp that will be settled, as well. What are those? I have no idea.

Chairman LIEBERMAN. I appreciate your answer. It was artfully done.

Mr. HÉBERT. Thank you.

Chairman LIEBERMAN. I am not going to push any further. I think it does leave some hope here for the folks in Oregon and Washington that there may be some possibility of refunds, but that is my conclusion, not—

Mr. HÉBERT. I am not going to draw any conclusions, but you are certainly welcome to, sir.

Chairman LIEBERMAN. Thank you. Let me ask this question by way of exercising our oversight function. For the moment, let us assume that—well, we do not have to assume anything. The fact that the ability to obtain refunds is contingent on the date on which an investigation is opened obviously puts a premium in that way and many other ways on a swift response to complaints.

One of the criticisms of FERC in this matter, and I will ask it now as a question, the criticism generally is that the Commission has acted too slowly here. Price increases began in California last spring or summer. I guess the Commission pretty quickly opened an investigation in July, but it was not until December that the decision was made that the rates were not just and reasonable. Then, incidentally, no investigation was opened until the end of April regarding non-California States on the Western grid, particularly in this case, Oregon and Washington.

So the question is, or the allegation is, that until Monday, in some sense, until last Monday, that the Commission has been sort of dragged along more by events and rising anxiety about economic impacts of prices in California than it has taken control of the events—until Monday. So I want to pose that question to you, Mr. Hébert. How would you respond to it? How would you defend the Commission's behavior? And then particularly that question about Oregon and Washington and why did you wait until late April to get into that?

Mr. HÉBERT. I will defend it by my record, Mr. Chairman. I would tell you that I think the record of this commission since January 22 has been solid.

Chairman LIEBERMAN. In fairness—excuse me—you did not arrive until January 22.

Mr. HÉBERT. I did not become chairman until January 22.

Chairman LIEBERMAN. I am sorry. You didn't become chairman until then.

Mr. HÉBERT. I was a commissioner, and actually, if you talk about proceedings and the ability to get proceedings before this Commission, under the previous chairman, the El Paso case has been one of the big cases that so many people have talked about and questioned about why we moved so slowly. I actually issued a concurrence in the El Paso case under the previous chairman that we had made enough procedural and discovery calls and it was time that we made decisions on the substance of the matter with the El Paso case and moved forward. And one of the first things we did when I became chairman of this Commission is to move forward with the El Paso case. A lot of people said, why did it take

you a year? Well, it was the same question I was asking, and I actually issued in a concurrence prior to being chairman.

We did study not only California and look at and try to make good balls and strikes calls when it comes to the Northwest, as well. I think if you look at January 22, getting through that process, getting what we had to be done at the staff level to get adequate information, to call the right balls and the right strikes, I don't think April is that bad, actually. I think that is actually pretty good. And if you, and I know you do, know as much about a government as anybody, that is a pretty quick call.

And at the same time, most people do not understand, we were working with a commission of three that, quite frankly, was left with a backlog of 2,000 cases. We have reduced that backlog by about 25 percent now while at the same time dealing with California, issuing refunds that had never been done before.

So I feel very good about our record and I think we are going to continue to move in a strong, fast, and furious, but reasonable and legal, manner.

Chairman LIEBERMAN. I want to yield to my colleagues in a moment. I could ask this as a question, but I am just going to make a statement on it. Just when you mentioned the backlog it came to mind that under Monday's order, FERC is taking on some very significant responsibilities to monitor energy markets in the West on a 24/7 basis. The question, and it is a larger question for another day, is how are you going to do it as a matter of process and organization? Do you have the personnel that will enable you to carry that out?

Mr. HÉBERT. I would like to quickly try to answer it, if that is all right, Mr. Chairman, because I think I do have an answer for you.

Chairman LIEBERMAN. Yes.

Mr. HÉBERT. Several things. One, this Commission saw that early on, actually through our Order 2000. We believed it was important through the regional transmission organizations to give them a monitoring role, to try to give them some shared responsibility. So that is a part of Order 2000 and that will help us monitor those markets.

At the same time, and I don't want to speak for my colleagues, I want to give them an opportunity, but if I recall correctly, there were some organizations, one including one division of FERC that was put together, that we all disagreed with. When I became Chairman, I reassessed our resources. I looked at those resources and I split that division back up, which was the litigation division. We had around 150 people. We needed at least half of those people, the technical people, to be involved in monitoring those markets. So we sent them to the division that properly would handle that through those markets and we sent the others to OGC to handle the legal situation at hand.

So I think we have taken our resources. Do we need additional resources in the future? We will see. Again, we are in an evolution mode, but I will tell you, we are moving forward with monitoring efforts. We probably don't have everything we need at this point. What will that include in the future, I will be glad to keep you abreast of.

Chairman LIEBERMAN. Yes, I would appreciate that, because that is part of our oversight role, as well.

One last final question, and a quick answer, I hope. We have talked about the order that you issued on Monday being effective through September of next year, 2002, which would take us, as a few of you have said, through the two summers, give time for this to settle out, and I think that is all good.

There is another perspective on it, not negative to what I have just said, which is that the folks in California have projected that supply will not be in any equilibrium with demand until about a year later. I will ask if any of you want to comment on it, but real quickly if you would, in deference to my colleagues, will you be open to extending the order beyond September of 2002 if that seems appropriate?

Mr. HÉBERT. I think it is important that we set a deadline, and as I said earlier, there are things out of our control—the siting of generation, making certain that generation comes on-line, dealing with Path 15, dealing with the intrastate network on natural gas. All these things are problems in California. If they get resolved, and they should be, then yes. If not, perhaps they do not get in 7 percent reserves. Perhaps they stay within 10 or 11 percent. My suggestion will be that, yes, the plan should change. To what extent, we can't make that call at this point.

Chairman LIEBERMAN. Does anybody else want to add to that? Mr. Wood.

Mr. WOOD. I think if the market rules are fixed and the infrastructure sufficient, then competition can work. Deregulation can follow from competition. And I think it is our job to make sure that the infrastructure is in place.

Chairman LIEBERMAN. OK. Thank you all.

Senator Carnahan, I think you were here first, if that is OK with Senator Carper.

Senator CARNAHAN. Yes. Thank you.

I have a question for Commissioner Massey. You said previously that you do not believe that FERC has met its responsibility to assure just and reasonable prices in the wholesale market. Given the experience in California, how might FERC reconsider its approach in the future to better reflect the current realities in the energy market?

Mr. MASSEY. Senator, I have supported the movement to markets for electricity with one caveat, and that is it must benefit consumers. And so it seems to me that we have to ensure that the markets are structured in a way that they produce just and reasonable prices all of the time, and if they don't, we have to intervene.

There are a number of things that we can do. First of all, we have granted market-based pricing to over 900 sellers using a screen that literally everyone passes. A market power screen that every seller passes is no screen. We may as well just issue a rule saying everyone passes. So I think we need to come up with a screen that is sensitive enough to actually measure market power in the marketplace and deny market-based pricing to those that have it.

Second, we need to get very serious about market design. We need to ensure that the rules are in place in the market so that

the market will produce just and reasonable prices in all hours. That is a big job in the California market right now. Perhaps the market should be redesigned to include an installed capacity market, a reserve requirement. We need to move dramatically away from over-reliance on the spot market. Progress has been made in that area. We need to do a lot of work to ensure that there is a robust demand response, in other words, consumers deciding not to consume electricity when the price gets too high. If we can achieve that goal, it will have a substantial price mitigating effect.

And the markets need adequate supply. Our experience in California makes me wonder whether we should have markets where we know that the supply is inadequate. What should we do? What protections should we build in if we know it is a capacity-short market and that prices will soar? So those are my thoughts on it.

Senator CARNAHAN. When you think of beefing up FERC's enforcement, I have heard from many that SEC might be able to serve as a model. The SEC closely monitors the market and it proactively investigates anything that seems unusual. Do you think that is a good idea?

Mr. MASSEY. It is a good idea if Congress is willing to fund it. It seems to me that to be the tough cop on the beat, I have come to believe that we need more resources than we have and we probably need more people involved in effective market monitoring. We need to attract—we have excellent economists and investigators, but we need to attract more, it seems to me. Perhaps we should look at the SEC model, but I think the SEC devotes about half of its staff to investigations. It is a large percentage. I don't know what percentage ours is, but it is probably a small percentage of our staff.

So I think we perhaps will need to retool, because whenever—despite our best efforts to structure good markets, there may be problems, there may be market power, there may be abuses, and we have to be willing to investigate those effectively and step in.

Senator CARNAHAN. Thank you. My next question is for Mr. Hébert. In your prepared testimony, you listed numerous actions taken by FERC over the past several months, and I understand that you have taken those actions based on your best judgment of how to help. In your view, have the prices in the wholesale market in California been just and reasonable?

Mr. HÉBERT. I think the mitigation plan that we put into effect April 26, that actually was effective as of May 29, and I believe the plan that we put into effect on Monday that will actually take effect tomorrow, is and will bring down prices to more reasonable levels. This Commission has spoken in its December 15 order to say, in fact, that we have found and believe rates to be unjust and unreasonable at certain times under certain conditions.

That was my belief then. That continues to be my belief, and that is why we have taken the action we have taken, to bring reasonable prices to the consumers of California and the West while at the same time attracting investment in supply and infrastructure that will continue to bring them better opportunities and, therefore, lower prices in the future.

Senator CARNAHAN. In the future, how do you feel FERC might play a more constructive role earlier in the process to better meet

its statutory obligation to assure just and reasonable prices when additional States now are undertaking deregulation, such as my home State of Missouri?

Mr. HÉBERT. I have said before, and I will say again, that FERC probably made a mistake—not probably, FERC did make a mistake in giving too much deference to the State of California in waiting too long to intervene and step in. We hate for government to intrude in any time that they don't need to, but clearly, we had a dysfunctional market. We needed to step in. We have done so now and I think the record will speak for itself that we are doing a good job of that.

So many people want to look in the rear-view mirror and talk about what happened last year and the year before. I wasn't the umpire at that point, so I am not going to go there. But I will tell you, I believe that we are moving in the right direction. Things are going to be better.

In saying that, I think it is only fair to say right now, since the Commission has been trying to move California away from its reliance on the spot market, and we are very proud of where they have moved. They have got around 20 percent—Commissioner Breathitt had talked about that—in the spot market at this point. Whereas we do want to move them away from reliance on that spot market, when we talk about forward markets and them moving towards the forward markets, I want to be very clear that there are forward markets that are reasonable and there are forward markets that, quite frankly, are very risky.

It is my thought and my belief that once you start getting outside of 5 years, if you get beyond that on signing contracts, I would tell you that those are very risky contracts, especially given the volatility of energy.

Senator CARNAHAN. Thank you very much.

Mr. HÉBERT. Thank you.

Chairman LIEBERMAN. Thanks, Senator Carnahan. Thanks for your interest in this subject.

Senator CARPER.

Senator CARPER. Thanks. I was here earlier today, and I don't know if you folks were in the audience then or not, but these hearings are broadcast on C-SPAN. Sometimes they show them at night and people might be seeing this around the country around 3 o'clock in the morning someplace. They are waking up from a little nap and say, what is this all about, FERC? I just think, a month or two ago, most people had probably never heard of FERC, and now you are getting to be a household word, almost like Lieberman. [Laughter.]

Mr. HÉBERT. We preferred, or at least I preferred the secrecy of FERC.

Senator CARPER. Well, you are a secret no more.

Mr. Hébert, you were saying that you became the chairman back in January but you served on FERC prior. How long?

Mr. HÉBERT. Since 1997.

Senator CARPER. All right. And Ms. Breathitt, how long have you been there?

Ms. BREATHITT. I joined the Commission in November 1997.

Senator CARPER. All right. And Ms. Brownell, you are pretty new, aren't you?

Ms. BROWNELL. A week that seems like a thousand years, Senator. [Laughter.]

Senator CARPER. You are a brave soul to take this on.

Mr. Massey, how long have you been on this team?

Mr. MASSEY. Eight years, Senator.

Senator CARPER. Eight years, wow. Mr. Wood.

Mr. WOOD. Two weeks.

Senator CARPER. Two weeks. OK. Let me just ask, for people that might be watching this around the country and are waking up in the middle of the night wondering what is this all about, could you just explain for them and for this late-arriving Member of the Committee—and I am going to ask our newest members to do this—just explain to folks who might be tuned in, what did you all actually agree to and announce on Monday of this week?

Mr. WOOD. What we agreed to do, Senator, was to take action, perhaps a little delayed action, but action nonetheless, to help repair a broken market out West. There is an electricity market that was deregulated through State initiatives in 1996, or 1995 time frame.

That worked pretty well at the beginning, but it quit raining and the State depends for about 30 percent of its power supply on the hydroelectricity. There was no new investment in new gas-fired plants or other kind of plants to keep the infrastructure in place. That confluence of bad weather and lack of investment and a deregulated market meant that prices went up.

The step that the Commission took this week was what it could do to help mitigate the economic impact of those events, but unfortunately, no step we could have taken or can take will make up for the fact that there are more megawatts being demanded than will be available to be used this summer. So we did not promise that it would be a panacea.

I think, quite frankly, we want to make sure that we mitigate not only the price, but mitigate the expectations that things are going to be rosy this summer in the West Coast. They will not. There will be blackouts. But I think what we wanted to take a step on was to make sure that those blackouts, the insult of those wouldn't be accompanied by the injury of a very high and unjust bill for the power.

Senator CARPER. Thank you. Ms. Brownell, do you want to add or take away anything from that?

Ms. BROWNELL. I would never take away from my colleague, only to add—

Senator CARPER. Unlike us. [Laughter.]

Ms. BROWNELL [continuing]. Just a little bit. And that is, I think that we laid out a road map. We took a number of steps. We laid out a road map that will give certainty to consumers, to the State of California, to the participants in the market there about what will happen through the next two summers so that we can begin to deal with the broader issues of a longer-term plan of how to site more generation, create market rules that actually work, and that will provide for just and reasonable rates in the long term. We took

the surprise of the day out of the market so that people now know what is going to happen.

I think the second thing we did was respond very positively to the stakeholders from California's issues and reached out to the State of California to work with them, because we all have a role to play and it is critical that we each do our part.

So I think we could give you 25,000 details, but most importantly, we took a lot of steps and we now have a plan, a map, and some certainty, and that is important.

Senator CARPER. All right. Ms. Breathitt and Mr. Massey, if I could ask you two the next question, and that is how do you know if what you have agreed on unanimously to do, how will you know that it is working or not working?

Ms. BREATHITT. We have a several-week trial of this plan having worked in what we call emergency conditions, when the grid operator in California says reserves have diminished to 7 percent. Our plan kicked into effect in late May and we have evidence that that methodology worked. What we did was extend that methodology to all hours rather than just triggering when there was an emergency condition called by the grid operator.

So we have some evidence that it worked the times that we were in an emergency, and we tweaked it slightly for the 24-hour condition to actually even limit more the market clearing price for the non-emergency hours. So we think that it will work. We have some evidence that it is working and what we did was extended the plan to all hours and we covered the rest of the Western States. So we now have it in 11 States.

Senator CARPER. Mr. Massey, do you want to answer?

Mr. MASSEY. Senator, I think the answer to your question is we don't know for certain whether it will work or not so we have to pay attention and—

Senator CARPER. What will tell you that it is working or not working?

Mr. MASSEY. For me, the real question in whether it is going to provide substantial price relief is tied to the costs of the last generator to be dispatched. It could have been tighter than that, but we know the price won't be higher than that in the market.

That last generator to be dispatched will probably be a natural gas-fired generator most of the time. About 95 percent of the dollars in the formula for determining the market clearing price under our order will depend upon the price of natural gas. That is it in a nutshell. If the price of natural gas remains reasonable, this plan will produce reasonable prices. If the price of natural gas skyrockets in California, the price for electricity will skyrocket. And so I think we still have a lot of work to do to ensure that prices for natural gas are just and reasonable, as well.

Senator CARPER. Mr. Chairman, I have one last question I would like to ask of Mr. Hébert, if I could do this as a follow-on. You have explained, and I think very nicely, what you agreed on and you have given us a pretty good notion of how you will know and maybe we will know if it is working. Let me just ask, when Governor Davis was here today, he described the unanimous step that you took, he described it as a step in the right direction.

Let me just ask, and this I would ask of you, Mr. Chairman, if the kind of success you are looking for and hoping for doesn't occur, what would be an appropriate next step?

Mr. HÉBERT. First, let me say that Governor Davis and I agree on that. It is a step in the right direction. What do we do from here? I think it depends on what we learn from here. My experience in government and regulation and energy markets, and I have been involved in legislating and regulating energy since 1988, my experience is it is important to listen and learn before you lead and I think that is what this agency has done.

I believe we have done that wisely, responsibly, and in the best interests of the consumers by looking at not only short-term benefit of bringing down prices and making them reasonable, but at the same time focusing on supply and deliverability and making certain that we have got an infrastructure that will work and will, in the long term, bring better prices and more choices to the people of California and the West.

What do we do beyond that? Some of it, as I have said, is outside of our control. We can't site one generating unit in California. The leaders in California can, and I believe and I hope that they are committed to that. We are going to look at this plan again on several opportunities. In the plan, we talk about looking to make certain that the generation that has been discussed and scheduled does come on-line in California, also that there is less and continued to be less reliance on the spot market.

So we are going to continue to monitor these markets. We are evolving through that process. We have got additional people working on that right now, as I have said. I have taken the resources at our agency and moved them around and taken half of those 150 people who were doing nothing but litigating and got them now monitoring these markets. We are going to have the regional transmission organizations through Order 2000 monitoring markets along with us. I believe we will be successful. If we have learned anything in the meantime that says we made a mistake or says that we need to change something we did, we will, in fact, do that.

Senator CARPER. Good. Mr. Chairman, I wish I could have been here for the whole hearing. This has been quite a hearing and we are grateful to each of you for being here today and for your service. You come to your positions, a couple of you, in a very exciting time, and Mr. Massey, for 8 years. For you, no purgatory, straight to heaven. [Laughter.]

Chairman LIEBERMAN. That was not a power of the Committee that Senator Carper was talking about. That is individual authority. [Laughter.]

Thanks, Senator Carper, for coming back, and for your thoughtful questions.

I thank the members of FERC for very good testimony. This has been a long day, very interesting to me and an important day, and I think ultimately an encouraging day. I mean, we have a real problem that occurred in California. There are a lot of reasons for it. I have the impression that everybody is now trying their best to make it better, and by your own judgment, last December, the rates for electricity were and are unjust and unreasonable and it

required action by yourselves and, of course, other kinds of actions by the State.

Though occasionally, because these are important matters and we are all in politics, there gets to be an edge to the back and forth. These are not ultimately partisan matters. We may have different ideological points of view. We may have different jobs to do. We may have different authorities. But these are real problems that cry out for solution and I appreciate the efforts you made.

The Committee is going to remain involved here. We think this is important. We would like to work with you. As I said, we not only are going to press you and ask you why you did this or why you did that, but sometimes we are going to ask you, what do you need to do th things we are asking you to do? And then, we will try to become your advocates.

I do think, as Commissioner Wood said earlier, the fact is that the Commission is at a new chapter in its history. The very fact that you have two new commissioners and you are now up to full strength says that. But also, I believe that, and you are more expert at this than I, but from what I know of FERC, that this has been a—we tend to use the term “defining moment” too much in our Senatorial lives, but it seems to me this has been one of those defining moments in the life of this Commission and that what follows will be different. And we need you to be actively involved because of the obvious central effect that energy pricing (that you have some authority over) has on the lives of individual Americans, but also on the vitality of our economy.

So I thank you very much for your service, for your patience today, for your outstanding testimony, and we look forward to seeing you again soon.

The hearing is adjourned.

[Whereupon, at 4:20 p.m., the Committee was adjourned.]

THE IMPACT OF ELECTRIC INDUSTRY RESTRUCTURING ON SYSTEM RELIABILITY

THURSDAY, JUNE 28, 2001

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Committee met, pursuant to notice, in room SD-342, Dirksen Senate Office Building, Hon. Joseph I. Lieberman, Chairman of the Committee, presiding.

Present: Senators Lieberman and Thompson.

OPENING STATEMENT OF CHAIRMAN LIEBERMAN

Chairman LIEBERMAN. Good morning, and welcome to our witnesses and our guests. We thank all of you for being here.

Two votes are going to occur in the Senate at around 9:50, so we can probably at least go until about 10 o'clock before we have to break for a while and then return, for which I apologize.

This morning, I am pleased to continue this Committee's examination of the Federal Government's response to the deregulation of the energy industry. This is the third hearing we have held on this issue in as many weeks.

In our first two hearings, we focused on the problems of electricity deregulation in California and the West and the need for more vigorous oversight and intervention by the Federal Energy Regulatory Commission.

Fortunately, last week, the Commission did step up its role in addressing the Western power crisis. This Committee will continue to keep watch on those efforts to determine whether they bring adequate price relief to besieged energy consumers.

Today we turn to a related concern, and that is the reliability of the electric grid. The grid is our energy lifeline, a vast network of transmission lines that carry electricity from a myriad of energy producers, large and small, to the utilities and ultimately into our homes and businesses. It is a lifeline that we take for granted every time we switch on the lights, sit down at a computer or open the refrigerator.

The national electric grid is vital to our lives and to our livelihoods, and it has been greatly affected by the deregulation of electric utilities. So today, we are going to ask who is operating the grid, and who is watching what is happening on the grid on behalf of electricity consumers, and who is it that keeps the lights on—or, as people in California no doubt have been asking, who is to blame when the lights go off.

Not long ago, that was an easy question to answer. Local electric utilities ran the show top to bottom. They produced the power for homes and businesses in their service areas, made sure there was enough of it, and saw to it that the electricity ran in the proper voltages and frequencies to be transported and used safely. Local utilities built and ran the transmission lines to get power from their plants to their customers, and they built interconnecting lines to neighboring utilities that allowed for modest trading in times of shortage.

That diagram is roughly meant to show how neat things were before deregulation.¹

But the deregulation of electricity markets has scrambled this picture.² Utilities no longer make the power they sell to retail consumers. Instead, electricity generators compete on the market to sell to utilities and sometimes even directly to retail customers.

Nor do local utilities anymore always control the interstate transmission lines. In several regions of the country, independent system operators, known as ISOs, act as electricity traffic cops, routing power from sellers to buyers.

That means that the ISOs are responsible for keeping the system up and running. So what was once a relatively sleepy, largely local network has been transformed into a fast-moving and extremely congested national electricity delivery superhighway.

While deregulation obviously offers potential economic benefits, the new arrangements it has brought to the national electricity grid also pose some risks to the reliability of the grid. In fact, a Department of Energy task force concluded in 1998 that the current configuration, devised in an age of far less usage of the transmission grid and far more regulation of the utility industry, is clearly “unsustainable in the newly decentralized and competitive electricity industry.”

In fact, problems have already occurred. A November 2000 Staff Report by FERC describes a disturbing incident in July 1999 when power was tight and prices were high. As I understand it, engineers monitoring the Midwest electricity grid noticed something unusual and troubling. Some of the electricity that should have been in the system just was not there. What happened? According to a later FERC report, Cinergy, a large Midwestern utility, just took power off the grid, which apparently it had no right to, in order to supply its own customers rather than disconnecting them or buying the extra power it needed, which would have been at significantly higher prices.

Another account of the incident which appeared in the *Wall Street Journal* notes that the utility put power back into the system later, but only after demand and prices had dropped. The utility was never punished for this behavior because the system has historically depended on voluntary industry standards rather than a regime of Federal regulation and enforcement.

Grid reliability has also been an issue in California, where the grid is managed not by the local utilities but again, by one of the new independent system operators.

¹ Chart entitled “Bundled,” appears in the Appendix on page 819.

² Chart entitled “A Fully Unbundled Electric Industry Model,” appears in the Appendix on page 820.

To fulfill its responsibility to keep the lights on in the spring of last year, the California independent system operator contracted to buy extra power in times of shortage from what is known in the industry as an RMR, "reliability must run" unit. But as an April 2001 FERC Order describes it, when the California ISO needed the backup supply last spring, some of these power plants did not cooperate. In other words, the "reliability must run" units were not reliable and did not run. According to the FERC Order, to keep the lights on, the ISO was forced to scramble to fill demand on the spot market, obviously at much higher prices.

FERC subsequently investigated that case and approved a settlement, with generators paying for the \$8 million difference in price.

Although FERC has jurisdiction over the interstate transmission system under the Federal Power Act, it has not historically regulated reliability. Instead, FERC has deferred this responsibility to regional voluntary Electric Reliability Councils, which include all of the electric systems in the continental United States, Canada, and part of Mexico. Industry has relied upon the voluntary standards set by these councils through their governing body, the North American Electric Reliability Council, or NERC.

With the changing structure of the electric industry, however, we now need to ask whether the Federal Government should play a more active role in maintaining and policing the national electricity grid. Indeed, Congress has actively considered amending the Federal Power Act to require FERC to establish reliability standards and a system for enforcement, although no such proposal has yet been enacted.

That is the issue that we are going to explore today. Some of the questions that I would like to ask include: Does the shift from heavily-regulated utility systems to deregulated competitive markets threaten reliability of the grid? If so, does FERC have adequate statutory and regulatory authority to protect the public interest in a reliable electricity transmission grid? And what is the proper division of responsibility between Federal and State regulators concerning electricity reliability overall?

I look forward to hearing our witnesses answer these and other questions, and I thank them very much for joining us this morning.

Senator Thompson.

OPENING STATEMENT OF SENATOR THOMPSON

Senator THOMPSON. Thank you very much, Mr. Chairman.

Our topic today is less controversial than the two energy hearings that we held previously, but this one is important. We have seen demand for electricity grow across the country, and we are watching as new generation is being built to try to keep pace.

What may be lagging behind, however, as you point out, is the new transmission and proper enforcement of standards to maintain the reliability of our grids. Prior to restructuring, integrated utilities were responsible for generating, transmitting, and delivering electricity from the power plant to the consumer. The reliability standards in place have been voluntary, established by the North American Electric Reliability Council, and when there is a violation, there is no penalty, even if the violation threatens the integrity of the grid, possibly resulting in blackouts.

In recent years, we have seen dramatic change take place. The electric power industry is dividing itself into different components. As a result, there is no single entity that is responsible for overall reliability. We have seen over the years instances, some of them serious, of individual actions that have adversely affected reliability.

So, as the electric power industry restructures, we need someone made responsible for ensuring reliability and someone who has enforcement authority.

We should note that the problem is not simply one of enforcement but also of investment. A greater demand on long-distance sales will require more transmission. I am pleased that the President recognizes this fact and included in his National Energy Policy Report the need to streamline the siting process to allow for construction of more lines. While the country moves down the road toward restructuring and competition, it is important not to leave any key component of our electricity system behind.

The good news is that we as a Senate have addressed this issue. The Energy Committee has held hearings on this topic, including one last month; I believe Mr. Cook testified at that hearing. In addition, in the last Congress, the Senate passed by unanimous consent a bill to establish an organization to set reliability standards and to take disciplinary actions when those standards are violated. That legislation did not pass the House, but it has been reintroduced this year.

Earlier this year, Senator Lott had planned to have an energy bill ready for the President's signature by July 4. Unfortunately, despite the urgency and need we have seen for some action, it does not appear that there will be discussions about the timing of such a bill until after the July 4th recess. Perhaps at that point we will address the energy issues which are becoming more and more critical every day and which are the focus of your well-timed hearings, Mr. Chairman. They of course will include the issue of the reliability of our system.

Mr. Chairman, I want to apologize in advance. As you know, we have the patient bill of rights on the floor, and my amendment is up as we speak, so I am going to have to break away. It has to do with exhaustion of administrative remedies; it is very exciting, and I am sure that you will want to be a part of that as soon as the hearing is concluded.

Chairman LIEBERMAN. And I am going to try not to be exhausted by it.

Thanks, Senator Thompson, for coming by. I appreciate it very much.

Let us begin with David Cook, who is General Counsel of the North American Electric Reliability Council, to which Senator Thompson and I both referred.

This is one of those hearings for which preparation educated me greatly, and I think the hearing will continue that process.

Mr. Cook, please.

**TESTIMONY OF DAVID N. COOK,¹ GENERAL COUNSEL, NORTH
AMERICAN ELECTRIC RELIABILITY COUNCIL**

Mr. COOK. Thank you, Mr. Chairman and Senator Thompson.

NERC welcomes the Committee's attention to the critically important issue of the reliability of the bulk electric system.

As you indicated, NERC is a not-for-profit organization formed after the Northeast blackout in 1965 to promote the reliability of the interconnected bulk electric systems. NERC comprises of 10 Regional Reliability Councils that account for virtually all of the electricity that is supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

For more than 30 years the industry has followed a system of voluntary reliability standards. Those standards have worked very well, and we have had an extremely reliable electric system. As you indicated, the reliability standards have no enforcement mechanism. Peer pressure has been the only means available for achieving that compliance.

As good as that system has been, the voluntary system will not serve us well for the future as the electric industry restructures. Here is why. The grid is now being used in ways for which it was not designed. There has been a quantum leap in the number of hourly transactions and in the complexity of those transactions on the grid.

Transmission providers and other industry participants who formerly cooperated willingly are now competitors.

Rate mechanisms which in the past permitted utilities to recover the costs of operating systems reliably are no longer in place or are inadequate given the increased risks and uncertainties they face.

The single, vertically-integrated utility that formerly performed all reliability functions for an area is being disaggregated, meaning that reliability responsibilities are being divided among many participants. Some entities appear to be deriving economic benefit from bending or violating the reliability rules.

Construction of additional transmission capacity has not kept pace with either the growth in demand or the construction of new generating capacity, meaning that the existing grid is being used much more aggressively.

The result of all this is that the transmission grid is being increasingly stressed, and that stress shows up in two ways. NERC is seeing more congestion on the grid for more hours of the day, and NERC is seeing increased violations of its reliability rules.

Not changing the way we deal with the reliability side of the business as the electric industry restructures would be like an airline switching to jet airplanes without increasing the length of the runways. Not having everyone follow a common set of rules for how the interconnected international system is operated would be like allowing individual airlines to choose their own routes and altitudes at which they fly.

NERC and a broad coalition of State, consumer and industry representatives have developed and are actively pursuing consensus legislation to convert the voluntary reliability guidelines into mandatory and enforceable rules.

¹The prepared statement of Mr. Cook with attachments appears in the Appendix on page 509.

The goal of that legislation is to set mandatory and enforceable rules for all operators and users of the international interconnected bulk power system in North America. It would be fairly developed and fairly applied by an independent industry self-regulatory organization with oversight in the United States by FERC and similar oversight by governmental authorities in Canada.

It would have respect for the international character of the interconnected transmission system, and regional entities would have a significant role in implementing and enforcing compliance with those common reliability standards.

Because of FERC's limited jurisdiction and authority, because of the international character of the North American grid, and because of the technical expertise required to develop and oversee compliance with bulk power system reliability standards, this is not a job that can simply be given to FERC.

Nor can we simply have regional organizations set and enforce their own rules in their own way. Having an independent international industry self-regulatory organization develop and enforce reliability rules under government oversight recognizes the interconnected and international nature of the bulk electric systems, takes advantage of the huge pool of technical expertise that the industry currently brings to bear on the subject.

That combination of industry technical expertise to work on the substantive reliability rules and government oversight, FERC and the United States, provincial regulators in Canada, to assure fairness in due process, is an effective and efficient way to address these issues.

As you indicated, the Senate passed a version of the NERC-supported reliability legislation last year. The bill died in the House. That legislation is before the Senate again this year, both in Senator Bingaman's bill, S. 597, and Senator Murkowski's bill, S. 389.

Your letter inviting NERC to testify specifically asked us to address the issues of the role of independent system operators and regional transmission organizations in maintaining reliability as well as the role of State commissions.

In the pending legislation, ISOs and RTOs are defined as system operators. As such, they must comply with the reliability rules established by the independent SRO. I would add that having the potential for RTO development is important. It is a positive development in being able to address reliability issues, because I think it will enable us to deal effectively with some of the issues that we are facing. If those RTOs develop all across the country, with the full scope and authority that FERC has envisioned for them, it will greatly facilitate dealing with some of the issues we face.

Nevertheless, since the actions of any one system operator can affect the result of the interconnected transmission grid, RTOs will still need to follow a common set of reliability rules independently established and administered by an international self-regulatory organization.

NERC commends the Committee for focusing on this critical issue of assuring the continued reliability of the interconnected bulk power system as the industry undergoes restructuring. Legislation now pending would allow for timely creation and FERC oversight in the United States of that needed industry SRO. The reli-

ability of North America's interconnected transmission grid need not be compromised by changes taking place in the industry provided that reliability legislation is enacted promptly.

Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thank you, Mr. Cook. That was very helpful and interesting testimony about the impact of deregulation on the grid, and I suppose I should say that it is not every day that we have a representative from industry coming to Congress, asking for regulation. So it is a measure of the new landscape in which you are operating.

Thanks.

Chairman LIEBERMAN. Mr. Harris, welcome.

**TESTIMONY OF PHILLIP G. HARRIS,¹ PRESIDENT AND CEO,
PJM INTERCONNECTION, L.L.C**

Mr. HARRIS. Thank you, Mr. Chairman.

I have prepared testimony that I would like to submit for the record if I may.

Chairman LIEBERMAN. Without objection, your testimony will be entered in the record. I have gone over the testimony that each of you have submitted, and I appreciate it very much. It is very thoughtful and very helpful to the Committee, and all testimony will be entered into the record of this proceeding.

Mr. HARRIS. Thank you, Mr. Chairman.

As you know, the critical test of any law or economic concept is the test of use. I come to you today from the Mid-Atlantic region where, for 4 years, we have been operating the world's most successful competitive wholesale energy marketplace.

We have over 200 buyers and sellers and traders in our marketplace, and we have an arrangement with five States and the District of Columbia wherein the States are active in the participation of this market development.

We have an arrangement where the environmental groups are active and participate in our marketplace and have meaningful input into the rules and practice and procedures that we follow in the Mid-Atlantic region.

We also have active participation by all of those who have an effective interest in our planning. We have a total regional planning protocol. As a matter of fact, we are the only region in the Nation that has a regional protocol. That has resulted in over 40,000 megawatts of generation being planned. Currently in the Mid-Atlantic region today, we have nearly 7,000 megawatts of generation under construction. Additionally, we have over \$700 million of transmission under construction to support that generation, so that over the next 10 years, we believe that we will not have a reliability problem.

We have many buyers and sellers and traders in our marketplace. What we have seen over 4 years of rolling up our shirtsleeves and actually doing it is that reliability has increased in the Mid-Atlantic region and that competition has worked.

Mr. Chairman, we have had over 70 different countries visit our area to ask questions about why is it working here and what are

¹The prepared statement of Mr. Harris appears in the Appendix on page 526.

some of the root elements that we are engaging in, what are some of the presumptions that we made several years ago that have born fruit today. It is from that perspective that we would like to share some thoughts with you today.

I think the first and most important thing that this Committee should do for the Federal Energy Regulatory Commission is ensure that it keeps its focus.

The second thing is to ensure that the Federal Energy Regulatory Commission achieves “end” solutions. As the Chairman mentioned, there are many needs that are important. You must meet the environmental needs. You must meet the State needs. You must meet the local needs. Having “end” solutions that achieve reliability and competition is what it is all about, ultimately.

The third thing is to ensure that the Federal Energy Regulatory Commission promotes a national energy marketplace.

If I may, I would like to talk about each one of these. First, ensure that the Federal Energy Regulatory Commission keeps its focus. The Energy Policy Act which was promulgated in Federal Energy Regulatory Commission Order 888 and FERC Order 2000 had one purpose, and that was to ensure that customers have the benefit of competitively-priced electricity. If we lose sight of the fact that the customers are the ones who are supposed to benefit from this change in the energy marketplace, we lose sight of the objectives of the Energy Policy Act that this Congress established and what it is all about.

We must ensure that we have the appropriate form over function. FERC Order 2000 delineates certain functions that are necessary to ensure that the customers will have the benefit of competitive price generation, and ensuring that the Federal Energy Regulatory Commission is true to those functions—that they do not “dummy them down,” that they insist on regional planning protocols, for example, so we can coordinate among regions to ensure that there is sufficient generation for reliability and ensure that the differences between regions are adequately addressed is absolutely imperative, and FERC should have that authority.

Second, ensure that FERC truly achieves “end” solutions. As the Chairman has mentioned, electricity touches the very fabric of our lives. We know that price is important, and it is important that pricing be done appropriately. Electricity is a speed-of-light ecological system. It is the only product in the world that, at the very instant someone wants to consume it, it is produced. You turn on the light switch, and nominally, you are controlling a nuclear plant. That process goes far beyond just the bulk system. It affects the distribution system, which the States are responsible for; it affects local delivery to the home, because it is an instantaneous, speed-of-light product.

In truth, there really are no pure reliability/economic principles. They all overlap and are intertwined. What we are seeing today with the wonderful network information technologies which PJM has employed quite successfully to enable these competitive marketplaces through technology is that these things are blending and merging. So it is very difficult to say this is reliability, and this is not. We would recommend that this Committee ensure that the

Federal Energy Regulatory Commission assert its authority over all the things to achieve these “end” solutions.

Third, we think that you have to have national energy marketplaces. We have seen competition work, but the electricity grid is like a giant synchronous motor. The Eastern connection is 650,000 megawatts; there is not another motor like that in the world. The West is a 125,000-megawatt motor. It needs to work well together, and the Federal Energy Regulatory Commission should take the lead in ensuring that we have a true national marketplace that can meet the focus of the Energy Policy Act, and that is to ensure that customers have the benefit of competitively priced generation.

Thank you, Mr. Chairman.

Chairman LIEBERMAN. Thanks very much, Mr. Harris. That was excellent testimony.

We will recess briefly now so that I can go over and vote, and then I will come back.

The Committee stands in recess.

[Recess.]

Chairman LIEBERMAN. The hearing is reconvened.

I apologize to the witnesses and others here. We ended up having two votes on the Senate floor; hopefully, there will now be a reprieve from floor action for a while.

Mr. Harris, thank you for your testimony.

We will go on now to Kevin Kelly, who is the Director of Policy Innovation and Communication at FERC.

Thank you, Mr. Kelly, for being here.

TESTIMONY OF KEVIN A. KELLY,¹ DIRECTOR, DIVISION OF POLICY INNOVATION AND COMMUNICATION, FEDERAL ENERGY REGULATORY COMMISSION

Mr. KELLY. Good morning, Chairman Lieberman.

My name is Kevin Kelly, and I am Director of the Division of Policy Innovation and Communication within the Federal Energy Regulatory Commission’s Office of Markets, Tariffs, and Rates.

I am appearing here today as a Commission staff witness, and I do not speak for the Commission itself or for any individual commissioner.

Thank you for the opportunity to speak on how the reliability of electric service is being affected by the industry’s restructuring and the Commission’s role in ensuring the reliability of electric service.

The Commission’s fundamental role in the electric utility industry is to regulate public utilities with respect to the sale of electric energy at wholesale in interstate commerce and the transmission of electric energy in interstate commerce. In short, the Commission serves as an economic regulator.

Since the electric power industry began, reliability has been primarily the responsibility of the customer’s local utility as overseen by State and local regulators. Increasingly, electricity trading over large regions leaves many matters affecting reliability outside the exclusive control of the local utility. So it is more important than ever to have reliability rules that everyone follows.

¹The prepared statement of Mr. Kelly appears in the Appendix on page 533.

But the Commission has no statutory authority to promulgate and enforce mandatory reliability rules.

One approach to ensuring reliability is to enact Federal legislation. In May, the administration released its National Energy Policy Report, calling on the Secretary of Energy to work with FERC to improve the reliability of the interstate transmission system and to develop legislation providing for its enforcement by a reliability organization, subject to Commission oversight.

I believe that a legislative approach is preferable to another approach that some have been trying in the absence of legislation, that is, to ensure reliability through contractual commitments.

Congress should understand, however, that mandatory transmission reliability rules alone are not enough to ensure reliable electric service. Senator Lieberman, you asked who is watching the grid. We believe it should be RTOs, and partly for reliability reasons, the FERC has strongly encouraged the formation of Regional Transmission Organizations. These RTOs would eliminate many of the reliability problems caused by the highly Balkanized way in which the interstate transmission grid is now operated.

In adopting its RTO rule, called FERC's Order 2000, in December 1999, the Commission set out at length the need for an RTO in each region to ensure reliability. The needs include coordinated operation and maintenance of interconnected transmission systems, improved determination of transmission system throughput capability, and unified regional planning of necessary grid additions.

The Commission required in particular that a RTO must have the authority to ensure the short-term reliability of the regional grid and also must be responsible for planning and arranging necessary transmission expansions and additions that will enable it to provide efficient and reliable transmission service.

But reliability requires more. It also requires adequate generating resources. A current issue, for example, is whether those who sell power to retail customers all over the country must maintain a specified level of generating reserves. Reliability also requires that generation support transmission in certain ways, and the Commission required in its "open access rule" of 1996, called Order 888, that all public utility transmission owners must offer generation-related ancillary services to their transmission customers, including the provision of minimum levels of generating reserves.

Senator Thompson pointed out in his opening remarks that to further ensure reliability, we also need to find ways to encourage the construction of new transmission facilities.

Market and regulatory rules must be designed to elicit sufficient investment in new transmission. For example, to provide transmission owners with an incentive to meet the needs of transmission users, the Commission could adopt performance-based rates reflecting the reliability of a transmission owner's system. The Commission already had authority to adopt such rates under the Federal Power Act.

In closing, restructuring of the electric power industry makes it necessary to consider new means of ensuring the reliability of electric service. The Commission has only limited authority to address reliability, and the need for new approaches is clear. Federal transmission reliability legislation is one such approach but alone is not

sufficient. The Nation must also develop regional transmission organizations for reliable grid operation and must develop its transmission and generation infrastructure.

Again, thank you for inviting me to testify this morning.

Chairman LIEBERMAN. Thanks, Mr. Kelly. That was very thoughtful and very helpful.

Mr. Popowsky—how did you get the name “Sonny”?

TESTIMONY OF IRWIN “SONNY” A. POPOWSKY,¹ PENNSYLVANIA CONSUMER ADVOCATE, ON BEHALF OF THE NATIONAL ASSOCIATION OF STATE UTILITY CONSUMER ADVOCATES (NASUCA)

Mr. POPOWSKY. I think it is because the first two children born to my parents were both daughters, and my father was determined that the next child would be a son and was determined to call me “Sonny” regardless.

Chairman LIEBERMAN. That is a good reason.

Mr. POPOWSKY. The other reason it stuck is because my real name is “Irwin” and that speaks for itself. [Laughter.]

Chairman LIEBERMAN. Understood. Well, “Sonny” seems like a good name to have for someone in your line of work.

Thanks for being here.

Mr. POPOWSKY. Thank you, Chairman Lieberman.

I am the Consumer Advocate of Pennsylvania. I am also past President of the National Association of State Utility Consumer Advocates, or NASUCA. From 1997 until earlier this year, I also served as the representative of small utility consumers on the board of trustees of the North American Electric Reliability Council. I am testifying today on behalf of NASUCA.

NASUCA is an organization comprised of offices from 40 States and the District of Columbia, charged by our respective State laws to represent utility consumers before Federal and State regulatory commissions and the courts. Our members’ primary interest is the protection of residential and other small utility consumers.

In your letter of invitation, you asked NASUCA to address “the challenges to electric system reliability resulting from the restructuring of the electric industry and its increasing reliance on competitive markets.”

In my opinion, there is no more important issue facing the electric industry and its consumers today. There remains great disagreement across the Nation regarding the relative costs and benefits of electric restructuring, but I believe there is little disagreement that if the road to restructuring leads us down the path of severely deteriorated reliability, then we will have accomplished little as a Nation and will indeed have set ourselves back, both economically and in terms of basic human welfare.

Today, I would like to discuss the role of the States, the NERC, the FERC, and the Regional Transmission Organizations in ensuring that the American public will continue to receive reliable electric service.

In my view, each State must continue to play an important role in ensuring reliability for its consumers. In practice, most day-to-

¹The prepared statement of Mr. Popowsky appears in the Appendix on page 545.

day outages and reliability problems that affect retail consumers occur on the local distribution system, which has been and remains under State jurisdiction. States have long experience addressing these issues, and Federal involvement here would be duplicative and less effective than the current State efforts.

Nevertheless, it is obvious that electric reliability problems can affect more than one State. Indeed, NERC itself was formed in response to the blackout of 1965 that cascaded across the Northeast with no respect for State boundaries.

In my opinion, NERC and its member Regional Reliability Councils have done an outstanding job of developing standards and tools to operate an extremely reliable electric network.

But as you have already heard, NERC is a voluntary organization that has traditionally had no ability to enforce its rules through anything more than peer pressure. To its credit, I believe that NERC has done almost everything that it can do, first, to open its doors to organizations like NASUCA that are outside the traditional utility industry, and more recently, to establish a fully independent board of trustees.

NERC and some of its regional councils have also attempted to develop contractual enforcement mechanisms to put more force behind their rules and standards.

But NASUCA agrees with NERC that more is needed, and we fully support the legislation that would establish a self-regulatory industry organization that would continue to develop reliability standards but whose standards would be fully enforceable and ultimately subject to the review of the FERC. I believe this proposal is essential in a world of increased competition. The players in this game can no longer also serve as the referees, and the referees must be able to do more than just issue warnings to the players who violate the rules.

What else can FERC do? I hope that FERC will turn its attention as soon as possible to completing the task of establishing a set of Regional Transmission Organizations across the United States. These organizations will play a vital role in the reliable operation and planning of the electric network. These RTOs in turn must coordinate their activities closely with their respective Regional Reliability Organizations and with any new national reliability organization.

Ultimately, every reliability standard will have effects on the economics of many transactions, and any economic transaction could have an effect on reliability. RTOs and reliability organizations must work together on wholesale bulk power issues, but ultimately, they must both answer to a single entity, which I believe for interstate purposes must be FERC.

I would like to close with a personal observation if I may about the electric restructuring experiences in California and my own experience in Pennsylvania.

Viewing the California situation from 3,000 miles away, I would have to say that even if wholesale prices had not spiked to absurd levels, and even if major utilities had not been thrown into financial disarray, the reliability impacts alone of the recent electricity crisis in California were totally unacceptable.

I never thought I would see the day when such a large segment of the American public could not be confident that their lights would stay on from 1 day to the next.

A few years ago, some people questioned whether there would be adequate generation supplies at reasonable prices in a restructured electric industry, but they were assured that “the market would provide.” Well, the market did not provide in California.

The question our Nation must face is whether the past year’s failure of the California market was the result of a “perfect storm” of events in which everything that could go wrong, including the weather, did go wrong or whether California was the “canary in the mine shaft,” giving the rest of the Nation a warning that we should turn back from this path as soon as possible.

In contrast, when I look in Pennsylvania at the current PJM market, I generally see reliable service, supply keeping up with demand, and prices that, at least most hours of the year, are close to what one would expect in a competitive market. The PJM market still has several flaws and is far from perfect, but at least the staff and independent board of PJM, as well as many PJM members, recognize these flaws and are taking steps to try to remedy them.

In closing, I am hopeful that our experience in PJM to date will turn out to be closer to the rule and that the recent California experience will turn out to be the exception. But I think we first need to ensure that entities such as the newly reconstituted North American reliability organization, the FERC, and the hopefully independent RTOs will have the tools to create enforceable reliability rules and market structures where the benefits of competition can be secured for all Americans in a reliable and economic manner. Thank you.

Chairman LIEBERMAN. Thanks, Mr. Popowsky, for your very interesting testimony.

Let me begin my questions by following up on the questions that you raised at the end of your testimony. They join the first two hearings, that we held on the California crisis, to this hearing.

How do you—and you have had some experience in this—answer the questions that you raised? In other words, how do you explain why reliability of electricity has become in doubt for this summer; and even though the prices are now, fortunately, moderating, there is still concern about blackouts. How do you explain why it happened?

Mr. POPOWSKY. It is easier for me to try to explain why it has not happened in PJM, so if I could start with that, I think that if you have rational market rules where people can come in and build power plants and know they can be interconnected to the system in a rational manner and that they will participate in a market that actually works, you do not need ridiculously high prices in order to get people to build power plants and have the supply meet demand.

I think again, from afar, in California, it appears that for whatever reasons, generators whom one would think should have been flocking to California to build needed generation did not do so, and there was a fundamental mismatch of supply and demand.

As I said, I do not see that happening in PJM, but I think you have to have the market structure and the rules in place, and they have to be understood in order for the market to have any chance of working.

Chairman LIEBERMAN. So if a big part of the problem was simply that the industry was not building new generating facilities, looking back at it, who should have done what to avoid the crisis that has occurred in California? That is a big question, but I am curious whether you see that there was a role for the government here. This part of reliability is the adequacy of supply, really, and what is coming onto the grid, if I hear you correctly, as opposed to whether the grid can handle it and whether it is being policed adequately.

Mr. POPOWSKY. Yes, I think that that is right, and that is why I raised the question, which is in theory, the market should provide the incentives to build the adequate generation.

In PJM, the theory gets a little thumb on the scale. If you would agree, Mr. Harris—there is a requirement in PJM that the parties which are called “load-serving entities,” the parties or companies that serve load, have to have enough generation to serve their load plus a reserve margin in terms of capacity that they must have in addition to what they think they might need in their peak hour.

So there is actually a requirement within PJM that requires participants in the market to have additional capacity over and above what they think they will need.

Chairman LIEBERMAN. Who sets that requirement? What is its origin?

Mr. POPOWSKY. I believe it is set by PJM in cooperation with the Regional Reliability Council, the Mid-Atlantic reliability council.

Chairman LIEBERMAN. Mr. Harris.

Mr. HARRIS. I have just a couple things to add to Sonny’s comments. I think we get back to some very elemental things here. In the Mid-Atlantic region, the questions you are asking were considered so important that we insisted that we had to have a regional planning protocol before we began commercial operations in our competitive marketplace.

We spent the years 1994 to 1996 negotiating with five States and the District of Columbia, consumer advocate groups—Sonny’s group participated—and environmentalists to come up with a regional planning protocol. So we are the only area that has a regional planning protocol in place before we begin competitive marketplaces. This is absolutely crucial to ensure that you will have capacity to meet demand.

Chairman LIEBERMAN. Was that one pursuant to some governmental authority or requirement, or was it just done voluntarily within the industry?

Mr. HARRIS. No, sir. To credit the political and other leadership in the Mid-Atlantic region, the States, they determined that this was such a crucial point that they wanted to have this in place. It took us 2 years to negotiate the protocol so that all five States and the District of Columbia, consumer advocates, environmentalists and others joined in this process. We filed that to begin operation as an independent system operator.

The second thing is a point which you made, that prices are important, and it is important to get prices right. So we developed a system that would make public transparent spot prices. We publish prices, every 5 minutes, on the electrical grid, and everyone can see the price, and transparent spot prices enable you to have appropriate competitive behaviors and enable people to determine when and if they want to build generation.

Chairman LIEBERMAN. Just talk a little more about that. That is very interesting. So that every 5 minutes, you are publishing the prices in that period of time from the various sources of electricity coming onto the grid.

Mr. HARRIS. That is correct. And if you want it, we can give it to you every few seconds. As a matter of fact, information transparency is so important to having a competitive energy marketplace that we have created a program which we call "E-data," and your staff and yourself can get on that program, and you can see these prices. Any individual can see what the prices are at any point in time, and then you can make your decisions based on that price transparency.

Chairman LIEBERMAN. Do people actually buy—what is the smallest unit of time that you can buy? In other words, how quickly can you change your purchases?

Mr. HARRIS. You can change with 30 minutes' notice, actually. We have hundreds of traders in any given hour. On hot days where the system is getting tighter, we have actually had 400 to 500 changes an hour in the marketplace. So another thing you need to have in your market is many buyers and sellers, which gets you back to the importance of having regional solutions when you move forward.

Chairman LIEBERMAN. Let me step back a little bit and go back to what the problem is and see if you can illustrate it before we get to some of the solutions.

As I hear you, and understand from what I have read and studied, part of the problem, or a big part of it, is the significant transition we have made to deregulated electricity markets, and the fact that the electricity grid, which was largely local or regional in the old model of a particular local utility building a power plant, arranging for the lines to get to its customers, creating some backup possibility where it connected a transmission line to neighboring utilities—now you have a very active deregulated market in which every 5 minutes, even every couple of seconds if you want, buying and selling is occurring over this grid, which was for the most part not built for this kind of traffic, so there are both congestion and reliability problems.

I cited two examples that we found as we were going over this. One was the Cinergy case, where they basically took some power which they were not entitled to; and the second was the California case where the backup units did not fulfill their obligation to come on in time of need.

I would just like to ask all four of you if there are other examples that you have of the problems which have come with the transition we have made to deregulated markets, just as a way of illustrating what we are dealing with here. Mr. Cook.

Mr. COOK. Another kind of situation—I think the congestion issue that you mentioned, with the limits on how much power we can transfer from one part of the country to another, is a very critical one.

Chairman LIEBERMAN. And of course, once that happens, it then goes to the very heart of deregulation, because it limits competition.

Mr. COOK. It can limit competition. It means that power cannot move into an area that might be less expensive, so people need to resort to more expensive generation, and in some instances, transactions need to be curtailed, because there simply is not enough ability to serve that load. That is one of the things that we are seeing, and it gives rise to the need that we have talked about to have a more robust transmission system.

Chairman LIEBERMAN. Mr. Harris.

Mr. HARRIS. Thank you, Mr. Chairman.

First of all, the two problems that you elucidated could not have happened in the Mid-Atlantic region simply because we are administered by an independent entity that has no financial interest in the marketplace. We have 10 different transmission-owning companies and hundreds of traders, and it is independently administered so it would not have occurred.

Chairman LIEBERMAN. Take those two cases and tell us how your region would have prevented them from occurring, or why they would not have happened.

Mr. HARRIS. It would not have happened because the operation of the power grid is done by an independent entity that has no financial interest in the marketplace. We have many companies. Cinergy was one company, vertically integrated, with everything under its control. We operate and direct the operations of the power grid neutrally and independently from all market participants.

Chairman LIEBERMAN. So what would happen in the case where Cinergy took the power off the grid that it was not entitled to?

Mr. HARRIS. Well, again, it would not have happened in our area. We saw the power change, because the frequency dropped, because there was not enough generation to serve load, and we were asking questions about who was not playing by the rules. That is how it came about.

Chairman LIEBERMAN. OK.

Mr. HARRIS. Two things that I think are problematic and symptomatic that this Committee could certainly look into are, first, the fact that electricity does get consumed the instant it is produced. It does not say this is only wholesale. It does not say it is only retail. It does not say it is just in this State. It travels at the speed of light. So the solutions that FERC needs to have need to be “end” umbrella solutions where you look at the whole thing. As Sonny was saying, things are not pure—pure reliability or pure economics—they blend. So it is extremely important to have a holistic view of the problem.

The second thing is in the way that institutions are getting approved. We have institutions now that have spot market authority. There are certain RTOs that do not administer spot markets, and that creates difficulties, as you saw. We need to come to the na-

tional energy market with common designs so that we can solve these problems much more quickly and robustly as we move forward.

There are other things coming out—the gas industry recently proposed an energy industry standards board. Some of the things that they proposed are interesting. They recognize that there is a nexus between natural gas and electricity, and there must be ways to resolve those issues as we move to the future.

So we are learning, and the process we have followed, we call “little steps, little feet.” It is very complicated. We take little steps. We learn, pilot, take the next step, learn, and increment our way to the future.

Chairman LIEBERMAN. Thanks.

Mr. Kelly, do you have any examples of reliability problems on the grid that might help illustrate the problem that we are trying to solve?

Mr. KELLY. There are many, but let me give you two—one, illustrating difficulties with incentives to build generation, and one with difficulties in incentives to build transmission.

You were asking Mr. Popowsky about California earlier. One thing that is rarely mentioned that I think is very important is that the West Coast is heavily dependent on hydro power. You have the Cascade Mountains down through Washington and Oregon, and the Sierra Nevadas through California; and starting around the time of World War I, they started developing the hydro resources there heavily. I think California is about 30 percent dependent on hydro. They had unusually heavy rainfalls in 1998 and 1999, that created a surplus of electric energy in the West, which created a disincentive for people to come in and build generation right away. And then, they had 2 years of drought.

It is my personal belief that with or without deregulation in California, the West would have been stressed over the last 2 years. With the old world of regulation, however, there were reserve margin requirements, as Mr. Harris has talked about. The California market design chose not to have such a requirement, at least of the old sort. It was not built into their system as it is built into the East Coast systems.

The FERC asked the California ISO and the California parties last November to consider having such a requirement. It is my personal belief that a reserve requirement of some sort is needed to incent generation construction in a market environment and to prevent the cyclical boom and bust of inadequate and surplus generation that can cause price swings.

Let me turn to a transmission story. We are seeing a lot of gas-fired generation being sited along the Gulf Coast right now in Mississippi, Louisiana, and Texas, probably much more than can be consumed in the area. Many of those generators, I am told, intend to sell up in the Upper Midwest, Chicago, and States to the east and west of that. There really is just not enough transmission capacity to move the power up there, and it is not being built, in part because many of the traditional utilities that own generation and transmission, I think, see themselves getting out of the transmission business—they would rather put their money into genera-

tion—but in part because there are old, antiquated grid rules that make things difficult.

Just for example, somebody who wants to move power from, say, Louisiana up to Chicago is likely to look at a path going through Tennessee and find that there is no capacity available. So it will look for an alternate path and find one that exists on paper that goes up through Arkansas and Missouri and gets into Illinois through that route, and it will reserve that path. But unfortunately, the electrons still flow through Tennessee, tending to overload the grid in Tennessee.

You might say, well, the solution is for the utilities in and around Tennessee, primarily TVA, to build more transmission. The trouble is they do not have a transmission customer. The utilities that have the customers are the utilities in the Arkansas-Missouri area.

So those are two examples, Senator.

Chairman LIEBERMAN. Those are very interesting examples. I don't want to break the trend here, but it leads me to ask for the record for those who are watching, just to help us understand—in the normal course, who decides whether additional transmission capacity will be built? Is that totally a market judgment where somebody has to come along and see an opportunity and decide to build—because that is a fascinating example. Plants are being built in Louisiana, more generation than the region needs, big markets up North, and how do you get the electricity there?

Mr. KELLY. In the old world, it was the individual utility that was building transmission primarily to distribute its own power around its own area, and it built some interconnection with its neighbors for reliability purposes.

In the new world that I have just described, I do not think that model will work. You need a large regional organization that encompasses all the utilities along all the flow paths from Mississippi to Chicago to decide when and where transmission should be built to meet the aggregate needs of the region. Hence the RTO.

Chairman LIEBERMAN. OK. So the vision that FERC has of the RTOs is that the RTOs would play that role.

Mr. KELLY. Yes.

Chairman LIEBERMAN. And how would they do it? Would they actually do the building of the transmission lines themselves?

Mr. KELLY. They would certainly do the planning and come out with a plan that meets the needs of a large region and have some role in either directing or carrying out the building.

In our rules, we allowed some flexibility to how an RTO would do that, because there are different flavors of RTOs. One, for example, might be a pure transmission company that would build and own it itself. But in another region, you might have utilities that are owned by government. TVA is one example, and the cooperative utilities in Missouri, for example, who feel that they cannot turn their transmission over, either by law or custom, to another entity. There could be protocols where those utilities could build transmission in response to a plan by the RTO and a compensation scheme devised by the RTO and subject to FERC approval.

Chairman LIEBERMAN. Mr. Cook, does NERC play a role, the reliability councils, in trying to make sure that there is enough transmission capacity to handle the electricity that wants to move?

Mr. COOK. Not in actually building the systems. NERC does do an assessment on a regular basis of the generation adequacy and transmission adequacy so that information is available about where the problem spots are and the kind of things that need to be taken on.

Chairman LIEBERMAN. Mr. Harris, what about PJM; what are you doing with regard to the need for new transmission liens?

Mr. HARRIS. As I mentioned, we do have a regional planning process which is independently administered. We believe that the person who is doing the planning should not own the transmission; it should be those who are in the transmission business.

We look at things regionally and ask what is the least-cost solution to ensure that generation will meet load over all five States. That is why we have approved and now have \$700 million worth of transmission under construction.

Chairman LIEBERMAN. Who is doing that?

Mr. HARRIS. My office is doing that.

Chairman LIEBERMAN. I mean, who is actually building the lines?

Mr. HARRIS. Each individual utility is building the lines that go through their particular territories.

Chairman LIEBERMAN. And how did you get to that point? In other words, you saw the need, and you planned, but how did you make sure they would go ahead and build the lines that were needed?

Mr. HARRIS. I think it was the maturity and the development of our marketplace. The companies got together and said this is going to be the reality of the future, and if we have a neutral and independently derived plan from somebody with no financial interest in the outcome, we will obligate ourselves to build and construct in accordance with that plan. That is what they agreed to back in 1996, and that is what we are following today.

Chairman LIEBERMAN. In the new deregulated market, are those generating companies, or what I used to call the utilities that are actually selling to the customers, who are building the lines?

Mr. HARRIS. They are the utilities. In our market, someone could come in in a merchant capability if they so desired and do it if they wanted to; they are not precluded.

The intriguing question that Mr. Kelly raised does bring up an interesting point as to how you get the broad interregional needs. With RTOs that have the planning functions, the key is making information available to those who have a commercial interest and can achieve an appropriate economic solution. In many instances, transmission is competing with generation to come up with the same solution. The problem they all have is how do I get the information so that I can make an informed decision.

Chairman LIEBERMAN. Mr. Popowsky, let me come back to the earlier question about whether you had in your work, either in Pennsylvania or information from your colleagues, illustrations of what the problem is with the grid now as a result of deregulation.

Mr. POPOWSKY. Again, in our area, we have not seen the kind of reliability problems arising as a result of market failure. I do think, however, that we have seen some instances where it would have been a lot better if we had had more and different generating companies on the system.

For example, the market for capacity—as I said, capacity is very important in PJM to make sure we have enough available. On the other hand, it is not a very liquid market, and if we look at the prices this past winter, they went from zero to \$177 a kilowatt-day and stayed at \$177 for 2 months. And two summers ago when we had a heat wave, the energy price actually went up as high as \$900, which is really unprecedented and, fortunately, I do not think has happened again.

But as I said, in PJM, we are making strides so that when things like that happen, the PJM Market Monitoring Unit and the PJM board can look at those things and either try to reach a resolution itself or come to the FERC with resolutions, as they have done over the last few months, to try to correct these remaining market flaws.

If I could just mention one other thing about the Cinergy example, as Mr. Harris indicated, it is not a question of what PJM would have done at that point if that happened; it is that if you have a truly independent system operator who is operating the system, that will not happen. And my recollection is that when it did happen, I think the NERC board and the regional council were able to basically send a nasty letter saying “Do not do that again.” That is why we need the legislation so that FERC can follow up on that nasty letter with a little more authority.

Chairman LIEBERMAN. “Strong action to follow.”

Mr. POPOWSKY. Yes.

Chairman LIEBERMAN. Just to summarize what you have said, as I recall in the statements you submitted, Mr. Kelly and Mr. Cook, you both indicated that the number of violations of reliability rules are increasing in the deregulated market nationally, and I assume nobody on the panel would disagree with that.

Mr. Cook, did you want to add something?

Mr. COOK. Just to reaffirm that statement, that we are seeing more of that as the system is being stressed more; yes.

Chairman LIEBERMAN. Let us talk now about what to do about it. As I listened to the first two witnesses, Mr. Cook and Mr. Harris, I thought that I heard a difference of approach, and please correct me if I am wrong. I thought, Mr. Cook, that you were talking about the desirable answer here being to establish independent authority through NERC, through the North American Electric Reliability Council, with some oversight from the Federal Energy Regulatory Commission.

But I thought, Mr. Harris, that you were focusing more on having FERC do this themselves, without a separate, independent group overseeing. Did I hear it correctly, and if so, can I invite the two of you not to get into a crossfire here, but to elucidate your points of view.

Mr. COOK. The first point is that the panel report that you quoted from in your opening statement—NERC had an independent panel of experts come in about the same time to look at

how ought we be treating reliability as we go forward. Both of those groups came to two conclusions. One was that we needed to have the rules be mandatory and enforceable. Then the question is what is the best way to accomplish that? Both the Secretary of Energy's panel that you quoted from and NERC's own panel of experts came to the conclusion that the best way to do that was to use an industry self-regulatory organization modeled after the SROs that are presently in operation in the securities industry. That is a way to have the industry expertise brought together and have government oversight there to make sure the process is fair and open. It is also a way to deal with the international character of the grid.

As Mr. Harris said, the interconnection is one big machine. The map that I attached to my testimony indicates the scope of that machine, including the provinces in Canada as well. It is necessary for that machine to operate under a single common set of rules. If FERC was to set the rules for that, in effect they would be dictating what the rules would be in Canada as well. Having the international organization set those rules, Canadians participate now extensively in NERC activities, and that would carry forward into this new organization. That is a way to deal with that international issue as well.

Chairman LIEBERMAN. I was going to ask you if there is a model existing for what you propose, and from what you are saying, I gather that it is in securities regulation.

Mr. COOK. In the securities regulation area, where you have the stock exchange and the NASD take on the role of setting rules for their marketplaces and how the broker-dealers are to be handled, under oversight by the SEC. The exchanges develop their rules, they are filed with SEC, and that gives them the legal authority to enforce them. SEC has independent authority to carry out its own enforcement activities if it sees a need to do that.

Those features are really built into the legislation that is before you now. It is the same model that we have used.

Chairman LIEBERMAN. Mr. Harris, what is wrong with that?

Mr. HARRIS. What we have learned over 4 years of looking at how do you get to competitive marketplaces and ensure you have the reliability necessary is that it is a learning curve. I also served on the NERC board of trustees, and I am the regional manager of the Mid-Atlantic Council, so I am very close to these issues and the genesis and the development of them.

But we have made over 110 changes to our rules since we started by incrementally learning and growing. What we are seeing now in this industry is that we really need to deal with the realities. I think you said it very well—we have to address all the needs. There are environmental needs, there are State needs, there are local needs. And how we develop those is going to be extremely important to ensure that we do not have any more huge unintended consequences and missteps.

So as we look at what is necessary to make sure those things happen, it should definitely be this Committee's oversight of the Federal Energy Regulatory Commission to ensure that the total holistic solutions are met, and met reliably. FERC has to have oversight.

We are also finding the convergence of industries. Gas is important to what happens in electricity, as you have heard today. We were somewhat intrigued by the gas industry's proposal to solve this problem with an energy industry standards board where the current NERC would have a meaningful role in that process. This needs to have more thought, and it needs to be looked through.

So our suggestion is that it needs to have FERC oversight, and the simplest way to do it would be to have the Federal Energy Regulatory Commission determine what is a necessary reliability organization and have the Federal Energy Regulatory Commission determine the scope and extent of that organization. Then we can get into the details without bothering the Committee. But I think this Committee should ensure that the Federal Energy Regulatory Commission puts forth some organization that allows that to take place, and we should learn from our experiences as we grow.

Chairman LIEBERMAN. Interesting. So if I am hearing you correctly, you are saying that the Federal Energy Regulatory Commission ought to make this decision, and not to presume that NERC is going to play that role, but obviously, that would be one of the options that FERC would consider.

Mr. HARRIS. Yes, sir, that is correct.

Chairman LIEBERMAN. Mr. Cook.

Mr. COOK. I was just going to say that under the legislation, the Federal Energy Regulatory Commission would be making that decision. That is, FERC would make the decision on what organization is going to carry forward once that legislation passes. The organization would submit a proposal to FERC saying "We propose to take on that function and here is how we propose to meet it, and here is what we would do." So that feature really is built into the legislation.

Chairman LIEBERMAN. Mr. Kelly, what is your reaction on the FERC to this question of how to best organize a legislative response?

Mr. KELLY. In terms of the differences that Messrs. Harris and Cook have expressed, if there are real differences, I do not see them as 180 degrees apart; to me, they are 5 or 10 degrees apart. Mr. Harris wants to put a greater emphasis on the coming RTOs than he perceives NERC is placing. NERC has drafted a bill that puts emphasis on NERC and regional councils.

In my personal view, when we get right-sized RTOs and right-sized regional councils, the councils will be coincident with the RTOs, and most of the differences that they may think they have will disappear.

Chairman LIEBERMAN. Mr. Popowsky.

Mr. POPOWSKY. I would agree, and I think that is what the legislation is intended to do. There is a discussion of what the role of the States is through a savings clause. There is a discussion of coordination with Regional Transmission Organizations.

I think, though, the bottom line is that both of the final decisions should come down to FERC. But that does not mean that FERC staff have to be sitting there, trying to develop reliability standards. That is better done by the new NERC or NAERO group, I think. Even today, they have a tremendous staff who focus on reliability. That is their area of expertise, and they should be working

with the RTOs, coordinating their activities, and then, ultimately, it should be up to FERC to make those tough calls as to how much to emphasize reliability versus economics and how to reconcile those.

Chairman LIEBERMAN. Do any of you want to add anything about the legislation that is before us? We have both the Murkowski and the Bingaman proposals.

Mr. COOK. On the reliability piece, Mr. Chairman, those bills are the same.

Chairman LIEBERMAN. Right. So that, basically, your request would be to get one of them adopted, but certainly that part of them adopted, and there is no real difference between them on reliability.

Mr. COOK. That is correct.

Chairman LIEBERMAN. Mr. Popowsky, the National Association of State Utility Consumer Advocates which you represent here today filed comments with the Department of Energy, as I believe you know, that argue quite forcefully that FERC needs to act on reliability whether or not Congress passes additional legislation, and also argue that FERC has the authority to do so.

I wonder if you are in a position to talk a little bit more about that now and if so, prior to the legislation, since we know that is hard to predict around here, what would you like to see FERC do?

Mr. POPOWSKY. In light of what has happened over the last several months starting with the realignment—in other words, in February 2001, NERC did turn over its trusteeship to the new independent board of trustees. In addition, they began to establish contractual enforcement activities.

Our first preference is certainly to pass legislation. If legislation is not passed, then FERC can certainly go back and try to eke out whatever authority it does have to address reliability matters.

I personally think that is by far a second-best or much worse solution to giving FERC the actual authority to review reliability rules that would apply to all actors in the market and not just those who are under FERC's jurisdiction already.

So that would still be by far the lower priority, and as I look at it, a better use of FERC's resources now would be to really get the RTOs in place, because the RTOs also have a reliability role, and to make sure that we have a national set, a complete set of RTOs that also have reliability authority, and that, clearly, the FERC has the ability to do. That would certainly be my preference at this point.

Chairman LIEBERMAN. You kind of anticipated my next question. Mr. Kelly, one of the points you made in your statement is that FERC does not have jurisdiction over a number of the utilities that control parts of the transmission grid, such as Federal power administrations or municipally owned utilities.

I was interested in the fact that the recent order that FERC set regarding the Western power markets includes conditions on every utility that sells into the federally-regulated transmission system out West, including the Federal power administrations and the municipally owned generators. So I wonder, prior to the legislation, if it is possible for FERC to act on reliability concerns throughout the

system, including both the Federal and municipal parts of the system.

Mr. KELLY. I suppose it would be possible, Senator, with a great stretch on our authority, but there are difficulties. The California situation, I think, caused the Commission to desire to act quickly and forcefully and to put a solution in place, by interpreting its jurisdiction just about as broadly as it could, probably more broadly than it would going into a new area.

There is a real question, I think, if you are building reliability for the future—such an important topic that affects all 50 States and our neighbors in Canada and portions of Mexico—if you would want to build such an important enterprise on what might be an untested legal foundation.

In addition, I might add, we were imposing conditions on generators who were using the transmission system that was jurisdictional to us, and imposing those generation pricing conditions as a condition of using the grid that was jurisdictional to us—I am not sure we could quite use the same rationale to impose conditions on transmission systems that were not jurisdictional to us. And one-third of the transmission in the United States is not FERC jurisdictional.

Chairman LIEBERMAN. Say the last sentence again, please.

Mr. KELLY. One-third of the transmission in the United States is not FERC jurisdictional. When you look at TVA, Bonneville, the Western Area Power Administration, and add in the State-owned systems like the New York Power Authority, the whole State of Nebraska, which has publicly-owned transmission and utility systems, and all the major municipalities, and then add in the large cooperative utilities that are financed by the rural utility service and hence, when so financed, are not subject to FERC jurisdiction, it is fully one-third of the transmission lines.

Chairman LIEBERMAN. That is interesting.

Does everyone on the panel agree that one of the most important parts of legislation would be to make sure that there would be one set of standards and one enforcement mechanism since, if there is anything that I have learned from this hearing, it is that everything is interconnected. Do you agree?

Mr. COOK. Yes, sir. The letter that I attached to the testimony that we sent to the members of the Senate Energy and Natural Resources Committee included a long list of folks who are supporting the legislation, and on that list are the coops, the public power people, folks that, normally, you would not think would be suggesting that jurisdiction be extended over their members. But for purposes of the reliability bill, they have all signed on, if you will, and are supporting that effort.

Chairman LIEBERMAN. Are there any other responses? Mr. Kelly.

Mr. KELLY. Well, I would agree, maybe adding a footnote that NERC's rules themselves do recognize there may be regional differences; for example, some of the rules as applied in a hydro-dependent region might be different from the rules in a wholly coal-fired region.

So NERC has a standard rule, but the rule itself allows for variation. So with that footnote, I would agree with the statement.

Chairman LIEBERMAN. Mr. Harris.

Mr. HARRIS. One additional footnote is that we just cannot ignore the physics. It is consumed the instant it is produced; it is a speed-of-light product; it does not know State boundaries; it is the consumer from the generating plant and the fuel behind it. So we cannot just carve out the wholesale business from the retail business. You cannot just carve out the States. You cannot carve out the environmental. It is a separate problem.

The Federal Energy Regulatory Commission needs to have holistic authority to ensure that this thing will work together as a single, synchronized motor.

Chairman LIEBERMAN. It is really quite remarkable, and I do not know that I fully understand it—one of you referred to it before—about the example of the Louisiana utility trying to get its power to Chicago. But in a regulated market where utilities, conceptually, should be able to buy from generators anywhere on the national grid—at one point, I remember having a conversation where it was suggested that customers actually might—that is, business customers or even residential, ideally—would be able to choose where they wanted their power to come from based on a competitive model. The conceptual difficulty is in visualizing how this happens. It is one thing, as I said to my staff the other day, for me to understand that if I want to buy shirts from a particular mail order house, I have a series of choices to make, and then I know that they are going to find their way, either by airline or by truck, to Federal Express or UPS or whatever, to my house. But how does one envision how those units of electricity get instantaneously from a generator that may be halfway around the country to my utility in Connecticut, let alone to me?

What I have been told is that they do not—is that right? In other words, somebody is adding to the pool, and what my utility is taking out is probably not part of that even though I am paying at a rate based on what that generator has added to the transmission grid.

Mr. HARRIS. I appreciate your comment. That is the beautiful thing about moving to competitive electricity marketplaces. We now have over 100 different companies trading on the market in any given hour, from Florida, Texas, and Canada, all trading into the PJM marketplace.

The Federal Energy Regulatory Commission has approved a pilot program this summer where we have economic incentives for individual customers to buy and make choices based on the spot price of electricity.

Chairman LIEBERMAN. Not utility companies—but customers.

Mr. HARRIS. No, sir. Individual customers to make economic decisions based on that spot price. What we are seeing is the beautiful things about network information technology—the power and speed of processors, the broad bandwidth capabilities that will enable competitive enterprise to work down to the individual level. While it may be complex in administration, one of the things that we have found, again through these technologies, is that we can actually make the life of the customer more simple and more convenient through the use of these technologies.

It is also something, I might add, that the Committee might want to ensure that the Federal Energy Regulatory Commission

has, and that is the appropriate technology and tools to have oversight over this vast network of process. That can happen; they can understand what is going on in prices to see if it is an anomaly over a broad scope, and technology will enable that today.

Chairman LIEBERMAN. And the truth is that without technology, you could not do it; you could not monitor it. Too much is happening too quickly.

Mr. HARRIS. That is correct. We can do things now that were impossible a year ago, and the technology keeps growing rapidly so that we can take this speed-of-light product and really simplify the life of the consumer and add value to the economy in these ways.

Chairman LIEBERMAN. Now that we are on this fascinating subject, just very briefly, how is the individual customer going to tap into the information that will allow him or her to decide where they will buy the electricity to their—are we talking about to their house, or to their office building, or—

Mr. HARRIS. If the individual customer wanted to do that to their house, they could. Remember that we are developing our program “little steps by little feet,” so we have a pilot program that we are running that we call an “economic program.” It is interesting—we filed the program, and the Federal Energy Regulatory Commission approved it for this next season, and in that program, we negotiate a way where individuals, customers or small businesses, can see that spot price and then make decisions on whether they want to isolate to the grid, i.e., buy megawatts, or where you would actually pay them to come off the grid at their choice—

Chairman LIEBERMAN. And they see it on their personal computers, for instance?

Mr. HARRIS. It is seen through some type of networking tool that would allow that information to be there. Again, this is a pilot program, but what it shows is the promise of the future.

I think that one of the sad things about the California situation is that it masks the wonderful opportunities that we now have in a networked information economy, and somehow, we need to get back to that.

Chairman LIEBERMAN. Yes. Mr. Popowsky.

Mr. POPOWSKY. In terms of residential consumers, I think most of the participants will be larger commercial and industrial customers, at least initially.

Mr. HARRIS. Yes, we have some small commercial, but there is nothing that precludes a residential if they wanted to play.

Mr. POPOWSKY. But there are other things that can be done. To get back to your first example, I think one of the positive developments in Pennsylvania is that consumers who wish to do so can buy green power, that is, power developed from renewable resources. Now, as you indicated, it is not that you can get the power all the way from the windmill, two States away, into your toaster oven; but by patronizing with that market or with that company, that company will put more of the wind power onto the grid. So it is not that you get those kilowatt hours, it is that you contribute.

Chairman LIEBERMAN. People feel good about it?

Mr. POPOWSKY. We found in Pennsylvania that people are even willing to pay more, like they buy recycled paper goods at the supermarket. They are willing to pay more, and I believe they under-

stand that they are not literally getting those kilowatt hours, but they are contributing to getting more of those kilowatt hours onto the grid.

Chairman LIEBERMAN. Very interesting and very exciting. I thank all of you.

From the testimony that you have offered, I would conclude that dramatic changes have occurred, both in the markets, in the deregulation of electricity markets around the country, and of course in the increasing demand generally as our economy has grown, and as a result of the extraordinarily developments in technology, the grid as it exists now has reliability vulnerabilities to it and that the market and government and private groups have tried to react to those. But the general feeling I get from listening to you is that the current approach does not adequately fit the new reality of competitive markets and technology. Also, there seems to be general agreement by one path or another that the buck has to stop at FERC, that this is an area in which FERC has to receive new authority, that the ideal is if Congress were to clarify FERC's role here.

There are details that still need to be resolved about how the actual organizational structure will be built and will operate, and it is not clear, as I hear from you, in the absence of legislation, although some would argue on one side or another, what steps FERC should take except to continue to pursue its vision of the RTOs.

So I think some things are happening here. I think we do have a problem, and California is obviously the extreme example of it for a lot of reasons. But it is also clear that unless we act to improve the national electricity grid, consumers will not be able to achieve the maximum benefit from deregulation, and at worst, the lights will go off occasionally, or there will be unfair practices along the grid because there is inadequate monitoring and policing.

So I think it is critically important that we act on this legislation on which there seems to be general agreement. And Members of this Committee will do our part to make sure that is so, and we will continue to monitor FERC's oversight of these matters.

For me, it has been a very informative hearing. I will continue to be interested in it. As Senator Thompson said at the beginning, it is not quite as controversial or dramatic as the current crisis in California, yet this is all about prevention. This is all about taking the steps necessary to make sure that we do not have more Californias, more blackouts, and more pricing of electricity that is higher than it would be if we had a grid that was up to handling the generating capacity that will be coming on and to the opportunities that technology provides.

We will leave the record of this hearing open for a week if any of you want to submit additional testimony or if any Members of the Committee who could not be here today want to submit questions for you. But in the meantime, I thank you all, not only for your testimony, but for what each of you is doing to assure the reliability of the national electricity grid.

I thank you. The hearing is adjourned.

[Whereupon, at 11:40 a.m., the Committee was adjourned.]

A P P E N D I X

Statement of Alfred E. Kahn
before the
Committee on Governmental Affairs
United States Senate
Senator Lieberman, Chairman
June 13, 2001

I trust it will be helpful to the Committee if I frame this statement as an answer to the—in a sense—personal question: How and why could I, who have played a leading role in the deregulation of airlines, surface transportation and telecommunications, have joined some other economists in calling for the imposition of regulatory caps on wholesale electric rates in California?

This background of experience, will, I trust make it relatively easy for me to tread a judicious path between the deplorably ideological arguments and restatements of preconceptions that have characterized far too much of the public discussion of this issue—arguments between ideologues of the Right and Left, Greens and Browns, “liberal” Populists and Conservative “Realists.” (I had at first effort attempted to supply adjectives suitable respectively to each of these groups, and think it worth reporting to the Committee that I find characterizations such as “ideological,” “self-righteous,” “indignant,” “scornfully dismissive,” “arrogant,” “supercilious” seem to apply equally to all of them.

Since I have in this instance joined in what the eminent economist, William Safire, has characterized as

the demagogic call for energy ‘price caps,’ always politically satisfying at first—populist interference with the markets’ self-correction that would lead to worse shortages and rationing, to inflation and wage control.¹

I express the hope that commentators such as these will be at least partially satisfied that the sybarites of California and the politicians and militant consumer advocates who promised them the benefits of free markets without the risks are already being sufficiently rewarded for their opportunism. In a sense, the only substantial difference between us is their evidently greater

¹ “What to Remember,” *New York Times*, May 28, 2001, p. A11.

willingness to see retribution fall not just on the actual perpetrators but on the millions of innocents while generators—a number of whom, some responsible, non-populist economists have concluded contributed to their good fortune by withholding supplies at critical junctures—reap billions of dollars of economically superfluous profits.

Since the letter that I signed elicited the immediate response, from the President on downward, demonstrating a firm command of the first week of Economics 101, that caps would not only do nothing to solve the fundamental imbalance of supply and demand but by interfering with the elasticity response on both sides and particularly by discouraging the expansion of capacity, exacerbate the problem, I can respond most efficiently in the form of a few propositions from Economics 101.1:

- In the presence of extreme inelasticities of both demand and supply and in the presence of extreme shortages, such as have characterized California at times of peak demand, unregulated markets don't work very well.²
- True, the elasticity response of demand has been prevented by the ridiculously extended freeze in charges to residential customers, followed by grudgingly inadequate increases; but since the extreme shortages, producing 10- and 20-fold increases in wholesale prices, have taken the form of extreme spikes at particular times and places, and the overwhelming majority of customers do not have meters permitting them to be charged on a real-time basis, it has not been possible to elicit efficient demand responses, and the result has of course been severe blackouts. It is a truism that blackouts have occurred because most retail rates have not been free to increase to whatever extent necessary to prevent them. What is frightening to contemplate is the extent of that "extent."
- As against the minimal contribution of 10-fold increases in prices to an improved balance of supply and demand in such circumstances must surely be weighed not merely the income distributional consequences of such price explosions but the

² Even the explosion of California's wholesale prices has not prevented severe blackouts. Of course, that was because most retail rates were not free to increase to whatever extent necessary to prevent them. What is frightening to contemplate is the extent of that "extent."

adverse macroeconomic consequences of generators extracting hundreds—indeed thousands—of dollars a year from every inhabitant of the state, much as of the three-fold explosions in the prices of crude oil nationally in 1973 and 1979-80.

- The spectacular historical instances of price controls doing more harm than good—cited eagerly by opponents of our present initiative—by interfering with the expansion of supply—notably the controls on prices of crude oil and natural gas in the 1960s and '70s—have been ones in which regulation held prices below short- and long-term marginal production or opportunity costs. The caps advocated here would decidedly not hold them below the costs of additional supply. That cost-based price ceilings are not inevitably in conflict with economic expansions of supply is amply attested by the experience of the electric industry, to choose an example at random, during the entire half-century, 1945-95. If the literature agrees on anything about that experience, it is that cost-based regulation, as traditionally practiced, encouraged the goldplating of service and the very excess capacity that seemed to promise such enormous benefits to consumers during the past decade if rates were deregulated.
- There seems good reason to believe that the explosions of wholesale prices has not been a phenomenon of pure competition alone, but have reflected the not-necessarily-collusive or antitrust-law-violative withholdings of capacity at peak times, in order to lever up the market-clearing prices—a process that Professors Joskow and Borenstein have documented.
- In such circumstances, Economics 101.33 tells us, ceilings may actually result in expansions of offerings: there is no benefit in withholding supply in those circumstances, only sacrificed profits.
- Interference with the fundamentally required correctives—of expanded capacity, on the one side, and conservation, on the other—would of course be severely counterproductive. But where those supply-and-demand responses inevitably take time—to cite the most relevant example, at least a couple of years before the additional generating capacity is likely to come on the market—any discouragements can readily be prevented by making the price caps (a) designedly temporary, automatically sunseting within, say, two to three years, and/or (b) inapplicable to new capacity coming on line.

So much for elementary economics.

Testimony of Professor Severin Borenstein
before the U.S. Senate Committee on Governmental Affairs
June 13, 2001

Thank you for inviting me to appear today to testify on deregulated electricity markets and the lessons to be learned from the California market. I am the Director of the University of California Energy Institute and E.T. Grether Professor of Business Administration and Public Policy at U.C. Berkeley's Haas School of Business. In 1978-79, I worked as a staff economist at the Civil Aeronautics Board during airline deregulation. I received my Ph.D. in Economics from MIT in 1983. My areas of expertise include industrial organization, competitive strategy, government regulation, and energy markets. I have taught at the University of Michigan, U.C. Davis, Stanford University and U.C. Berkeley. I'm also a research associate of the National Bureau of Economic Research in Cambridge, Massachusetts. Since 1997, I've served on the Board of Governors of the California Power Exchange. Further information on my professional career and publications can be found at <http://haas.berkeley.edu/~borenste>.

I have written a number of articles on electricity markets, a list of which is appended to this testimony. I have also appended the most recent draft of a paper that analyzes the causes of the electricity crisis in California and proposes ways of making sure that similar failures do not take place as other states attempt to deregulate their electricity markets.

The California Crisis

The current crisis in the California electricity market starts with the fact that supply didn't grow fast enough to keep up with demand, but it does not end there. Demand did indeed grow very quickly, not just in California, but in the entire western electricity grid. Supply indeed did not keep pace. The shortfall was throughout the western US. The western grid outside California in fact had faster demand growth and slower supply growth than did California. The price effect due to the tight supply was exacerbated by cost increases both from rising natural gas prices and from increasing costs of NOx pollution permits.

The supply/demand mismatch and rising costs became a crisis in California, because the utilities that supply most of the customers in the state were buying a large share of their power in the electricity spot markets when prices skyrocketed. Unlike most of the other utilities in the western U.S. – which were either in states that were not going through deregulation or were municipal utilities – the three major utilities in California had sold

off a large proportion of their generating capacity. Thus, when the short-term price of electricity exploded, these utilities had no financial hedge against the impact.

At the same time, California's deregulation had been designed with a retail rate freeze, so the utilities were not able to pass along the high prices to consumers. This meant both that the utilities were buying high and selling low – a recipe for financial failure – and that consumers did not see any price signal that indicated they should cut back on electricity consumption.

All of these factors would have combined to create a very expensive mistake for California even if sellers had behaved completely competitively. But sellers were able to exercise market power, increasing further the cost of this mistake. The companies that were selling electricity in the wholesale market had figured out that when the market gets tight, they are able to drive prices up further by withholding some of their production or bidding power into the market at prices well above their costs.

Economists call this exercising market power. It is not in itself illegal so long as the companies do not act in concert. In fact, most companies exercise market power when given the opportunity. They try to charge as much as they can for their product, even if that means not selling quite as much as they could if they cut their price. Given the circumstances that these firms faced – a tight supply/demand balance, no demand-side responsiveness to the market, and a grid operator desperate to find the power to prevent blackouts – it would be surprising if generators didn't exercise market power.

While this behavior in all likelihood does not violate antitrust laws, it does violate the mandate of the Federal Energy Regulatory Commission (FERC), which is required to assure that wholesale electricity prices are just and reasonable. Even before the collapse of California's market, FERC had interpreted that mandate as requiring that it prevent or control any substantial exercise of market power. During the summer of 2000, according to research I have done with James Bushnell and Frank Wolak, the exercise of market power created a transfer of more than \$4 billion from California utilities to other sellers of electricity in the western grid. That seems to me to be a substantial exercise of market power.

Myths About the Cause of California's Supply Problem

As the crisis has worsened throughout the last year, two myths have grown about its source. The first is that the shortfall of supply is due to extreme environmental policies in California that prevented the building of new power plants. This myth continues to

be repeated even though even most generating companies have said that it isn't accurate. Two facts strongly contradict the environmental policy explanation. First, from 1995 to early 1998 there were virtually no applications to build new plants in California. Second, there was also almost no new capacity added during this time in the rest of the western grid, including Arizona and Nevada, where demand was growing much more rapidly than in California, and Wyoming, Montana, and Idaho, areas not generally thought of as extreme in the pursuit of environmental protection.

The second myth is that wholesale price caps have discouraged production or investment in the California market. Prior to November of 2000, this was completely wrong. During the summer of 2000, the price of natural gas and other inputs was low enough that firms were able to make very significant profits at even the lowest price cap (\$250/MWh) used during the summer. Indeed, wholesale prices in California were among the highest in the U.S., and there was a great deal of interest in building new capacity. At no time prior to November 2000 could one make a credible case that the wholesale price cap made it unprofitable for a company to invest in California.

This did change in November 2000 when the price of natural gas jumped to more than 20 times its 1998 level. At those natural gas prices, the \$250 wholesale electricity price cap was below production costs and many generators rationally chose to shut down. But the cap was then unilaterally lifted by the California ISO. Unfortunately, FERC then stepped in with a "soft cap," which was really no cap at all and only served to destroy the transparency of the market. The soft cap was part of FERC's ineffective December 15, 2000 response to California's problems. Like a number of previous FERC decisions, the December 15 order demonstrated that the policymakers at the Commission lacked a fundamental understanding of how electricity markets work.

The real reason that little capacity was built in the west was that there was widespread belief that there would be a glut of capacity in the late 1990s and prices would be very low. Indeed, the first three months of the California market reinforced this view, with the average prices dropping to \$10 per megawatt-hour in June 1998. Also, the mid-1990s were a time of tremendous uncertainty about the direction of deregulation, particularly in California, and the market rules that would result. That sort of environment does not encourage investment. As prices increased in the summer of 1998 and market rules were determined, interest in building plants, and applications to do so, rose. The problem is that modern plants generally take at least three years from conception to opening, leaving California short of power for an extended period.

The Two Policy Issues Facing California

California now faces two related, but distinct, areas where public policy must be decided. First, the state faces a crisis *this summer*, when supply will be very tight, the investor-owned utilities are in financial distress, and prices are likely to once again rise to extremely high levels.¹ Second, the state faces longer run market design issues that include the structure of retail competition, the role of the state government in the market, and design of a workable wholesale electricity market.

Unfortunately, many people are responding to the first policy area by suggesting solutions for the second. "Build more generation" is not a useful response to California's summer 2001 crisis. New generation planned today won't be online until at least 2004. Likewise, while improving transmission capacity is an important long-run goal, it has no relevance to getting through this summer, since transmission lines also take years to construct.

For this summer – which will likely be as bad as it will ever be in California – there are only a limited number of options. California must raise retail rates and take other actions to encourage conservation. The state is in the process of installing real-time meters in over 20,000 large business customers that in aggregate account for about 30% of the state's peak demand. These meters will allow a number of targeted programs that encourage large industrial and commercial customers to cut back at the times when conservation is needed most. But beyond this and the recent general rate increase implemented by the California Public Utilities Commission, the state leadership needs to encourage voluntary conservation. Programs to inform customers about how they can conserve and what actions will make the most difference are currently being rolled out by the state. There is no question that California was slow to implement these critical responses, but the state is now doing it.

With California now doing its part, it is time for the FERC to play a constructive role. The FERC needs to understand why its market power mitigation schemes have been ineffective, why its current plan is filled with loopholes, and what it can do to effectively mitigate market power. In the accompanying paper, I address the pros and cons of wholesale price caps. Short-term price caps can be implemented in a way that will reduce the exercise of market power and the massive wealth transfer from customers to generators

¹ The good news on electricity prices in the west that has come out in the last week mitigates my concerns only slightly. The forward prices for August are still higher than they were during summer 2000, and an unusually hot summer or unusually high number of plant outages could once again send them soaring.

without discouraging production from existing generation or investment in new generation.

Wholesale price caps, however, are not the only instrument available to FERC. Professor Frank Wolak has proposed an alternative under which generators who are currently able to exercise market power would be required to sign long-term contracts for a large proportion of their capacity. As explained in my accompanying paper, such long-term contracts reduce the incentive of sellers to exercise market power in the spot market. Once a generator had signed such contracts, it would be allowed to operate in the spot market without constraints. This is just one example of the options available if the FERC is willing to carry out the serious policy analysis necessary to deal with this complex problem.

Moving Forward with Electricity Deregulation

Despite the debacle in California, I still believe that deregulation of wholesale electricity markets can benefit consumers.² To implement successful restructuring of electricity markets, however, policy must come from careful analysis, not political ideology or sloppy analogies to other industries – such as airlines, natural gas, or telecommunications. The electricity industry has characteristics that make it especially difficult to deregulate successfully and especially costly if it is deregulated badly.

Airline deregulation was a success because careful policy analysis came before the major changes and continued afterwards.³ It required fine tuning through the transition years. It was based on economic analysis, not a blind faith in markets. With a similar approach, we can restructure the electricity industry to benefit consumers and the U.S. economy.

² It is interesting to note that critics of price caps point to their failed use in gasoline and natural gas markets in the 1970s as “proof” that price caps can’t work, but these same people dismiss the California electricity debacle as just “bad design” that can easily be remedied. They point to the successful electricity restructuring in the PJM market (Pennsylvania-New Jersey-Maryland), but fail to note that the PJM has price caps and Pennsylvania has implemented restructuring with a retail rate freeze.

³ The success of airline deregulation is questioned by some, but the failures they point to are generally failures of the federal government, to keep up with the success of deregulation by expanding airport capacity and to enforce the antitrust laws.

Electricity Articles written by Severin Borenstein

- "A Guide to the Blue Book," (principal authors Carl Blumstein and James Bushnell), *Electricity Journal*, September 1994.
- "Market Power in California Electric Markets" (with James Bushnell, Edward Kahn, and Steven Stoft), *Utilities Policy*, 5(3/4, 1996).
- "An Empirical Analysis of Market Power in a Deregulated California Electricity Market" (with James Bushnell), *Journal of Industrial Economics*, 47(September 1999).
- "Market Power in Electricity Markets: Beyond Concentration Measures" (with James Bushnell and Christopher R. Knittel), *Energy Journal*, 20(4, 1999).
- "The Competitive Effects of Transmission Capacity in a Deregulated Electricity Industry" (with James Bushnell and Steven Stoft), *Rand Journal of Economics*, 31(Summer 2000).
- "Price Convergence in California's Deregulated Wholesale Electricity Markets" (with James Bushnell, Christopher Knittel, and Catherine Wolfram), March 2000.
- "California 'Lessons' derive from a Mischaracterization of our work" (with James Bushnell), letter in *Electricity Journal*, March 2000.
- "Electricity Restructuring: Deregulation or Reregulation?," (with James Bushnell), *Regulation*, Vol. 23 No.2, 2000.
- "Understanding Competitive Pricing and Market Power in Wholesale Electricity Markets," *Electricity Journal*, July 2000.
- "California consumers haven't seen benefits of deregulating the electrical industry yet - What went wrong?," (with James Bushnell) *San Jose Mercury News*, August 27, 2000.
- "Diagnosing Market Power in California's Deregulated Wholesale Electricity Market," (with James Bushnell and Frank Wolak), POWER Working Paper PWP-064, University of California Energy Institute, revised August 2000 (in submission).
- "Electricity Pricing Should Clue Consumers to Judicious Use," *Los Angeles Times*, January 17, 2001.
- "The Trouble with Electricity Markets (and some solutions)," POWER Working Paper PWP-081, University of California Energy Institute, January 2001.
- "Frequently Asked Questions About Implementing Real-Time Electricity Pricing in California for Summer 2001," University of California Energy Institute, March 2001.

STATEMENT OF PROFESSOR WILLIAM W. HOGAN¹
BEFORE THE COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

JUNE 13, 2001

Thank you for the opportunity to participate in these hearings today. The energy market problems in California are serious. As Governor Gray Davis said, the recent good fortune, with several factors combining to produce lower prices in California, is probably only a "temporary reprieve." It is likely that the problems of high prices and rolling blackouts in the west will be with us again this summer. It is appropriate that this committee is addressing the topic, in order to understand the origins of the difficulties and to identify actions that might improve the situation.

The problems in electricity and natural gas are related, but I will focus my remarks on the electricity market. The California electricity crisis is the result of avoidable mistakes that produced a bad market design, combined with possibly unavoidable bad luck, that precipitated the market meltdown that first caught public attention in the summer of 2000. There is no doubt that the California electricity market is sick. However, it is important to recognize that the problems were apparent long before prices rose in June 2000. Well before that, almost from the beginning of operations in the new market in 1998, flaws in the market design were evident. These flaws extend beyond the now familiar restrictions on contract hedging and the disconnect between a policy of fixed retail rates and the volatilities of fluctuating wholesale prices, a disconnect that, when shortages and resulting high prices appeared, produced the financial crises that has left two utilities near bankruptcy.

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From the beginning, the California Independent System Operator (CAISO) was saddled with a set of market rules that required it to operate inefficiently and prevented it from using efficient pricing to support its reliability mandate. Forced to operate a market inefficiently and without effective price signals, the CAISO was left with the unenviable responsibility of trying to make the flawed structure work within these design constraints. When the inevitable problems from this flawed structure appeared, the CAISO began proposing a series of band-aid remedies that proved inadequate, even counter-productive. Eventually, at the end of 1999, the Federal Energy Regulatory Commission (FERC) halted these efforts and identified key elements of the market as "fundamentally flawed." This finding launched a process in California to completely re-examine the comprehensive market design from first principles. Unfortunately, that review was overtaken by events last summer. Since then it has been difficult to focus on the fundamental disease, given the prominence of the symptoms of high prices and rolling blackouts.

The question before this committee is what to do under the present circumstances. We agree that the patient is sick, but the appropriate remedy is less clear. Not all diagnoses lead to the same recommended policies. Some diagnoses are obvious. For example, it is clear that the electricity market fundamentally collapsed earlier this year, a disaster which included the bankruptcy of at least one large utility. Major market participants in California stopped paying their bills, and retail prices were held dramatically below the prices that were observed in the wholesale market. This was unsustainable. The diagnosis identifies the most urgent steps for Californians in helping the patient recover health: pay your bills in order to re-establish the credibility of transactions. No system can work without credit-worthy buyers. Further, to provide incentives for conservation, retail prices for incremental electricity should be raised to market levels, at least for commercial and industrial customers. Changing the rules and the metering to support demand responses would help on many fronts.

Other diagnoses are more controversial. For example, there is a debate about how much of the electricity price increase we have seen has been caused by a shortage of supply as opposed to how much has been caused by strategic withholding of electricity through the exercise of market power. The debate extends to alternatives for immediate relief, including

- uniform price caps,
- traditional cost of service regulation, and
- bid caps.

Uniform price caps would be counterproductive for all the usual reasons. As for traditional cost-of-service regulation being reimposed on the system, this might lower the average price paid by customers, but it is far from clear how this kind of administrative process could either facilitate the market or be implemented in such a way that would not exacerbate the immediate problems in the west.

To the extent that the problem of high prices results from a withholding of supply in order to raise prices, action may be needed, but the solution is not through a uniform price cap or cost-of-service regulation. A better approach would be to adopt bid caps, the procedure FERC has long supported for use elsewhere, such as in the Pennsylvania-New Jersey-Maryland (PJM) Interconnection or in New York. The bid cap requires generators to bid, subject to a cap on their bids that is related to their costs. Unlike with a price cap, the generators would still be paid the market clearing price.

The requirement to supply under the bid cap works in support of a competitive market and would counteract the effect of market power. On the other hand, to the extent that the problem is scarcity, bid caps won't do much to reduce prices. But if scarcity is the problem, then administrative action to reduce prices would make the market conditions worse, not better.

If the problem is scarcity, there is not much that can be done at this stage to improve the situation beyond measures to expedite new supplies and improve the ability of demand to respond to high prices. In short, I see no easy prescription for California for dealing with the symptoms of high prices and rolling blackouts. The best of a bad bargain would be to implement a bid cap regime targeted on any market power. This is very much in the nature of the rule adopted by the FERC in its Order of April 26, 2001. If there has been an exercise of market power, the FERC actions will go a long way to correcting the immediate problems. The Order could be improved, but it goes in the right direction.

However, the current FERC Order does not go far enough. My principal concern with these various palliatives is that we are engaged in a debate about whether to prescribe Advil or aspirin for a patient that is seriously ill. From the perspective of government policy, the long-term problem and the real disease are to be found in the many flawed features of the California market design. I have written on this subject elsewhere and provided for the record three papers which address the

issue of electricity market design; however, these longer arguments reduce to a simple prescription.

The best market design that we know of is the one that has been working so well in the east, such as in the PJM system, in New York, and is being adopted in New England. The California ISO should be redesigned from first principles to abandon the market design framework that has failed and to adopt something that has a better chance of working. These principles would include:

1. The ISO must operate, and provide open access to, short-run markets to maintain short-run reliability and to provide a foundation for a workable market.
2. An ISO should be allowed to operate integrated short-run forward markets for energy and transmission.
3. An ISO should use locational marginal pricing to price and settle all purchases and sales of energy in its forward and real-time markets and to define comparable congestion (transmission usage) charges for bilateral transactions between locations.
4. An ISO should offer tradable point-to-point financial transmission rights that allow market participants to hedge the locational differences in energy prices.
5. An ISO should simultaneously optimize its ancillary service markets and energy markets.
6. The ISO should collaborate in rapidly expanding the capability to include demand side response for energy and ancillary services.

I would be happy to discuss these principles further. It is my concern that we ignore the fundamental problems of the underlying disease as we focus solely on symptoms. The FERC cannot solve all the problems. Fixing the retail market is a responsibility that rests with the California regulators and, indirectly, with the governor of California. However, the responsibility for fixing the problems of the wholesale electricity market design rests primarily with the federal regulators at FERC. It is overdue for FERC to go beyond its previously passive and deferential treatment of the California market designers and take aggressive action that would be in the long-term public interest. This action is needed now in California, in the rest of the west, and in the many other regions of the country that are gridlocked over access to the grid. No market design will be perfect or will withstand drastic energy shortages. However, as we have seen, "fundamentally flawed" market designs run great risks.

The means are available through the FERC's powers to create regional transmission

organizations (RTOs). Through the creation of effective RTOs, the FERC has the opportunity and the responsibility to act. If competitive electricity markets are to work, FERC must act soon. Time is running out on further experimentation.

Attachments:

William W. Hogan, "Electricity Market Restructuring: Reform of Reforms," May 2001

Scott M. Harvey and William W. Hogan, "On the Exercise of Market Power Through Strategic Withholding in California." April 2001.

John Chandley, Scott M. Harvey, and William W. Hogan, "Electricity Market Reform in California," November 2000

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**ELECTRICITY MARKET RESTRUCTURING:
REFORMS OF REFORMS**

William W. Hogan

May 25, 2001

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**ELECTRICITY MARKET RESTRUCTURING:
REFORMS OF REFORMS**

William W. Hogan¹
May 25, 2001

Electricity systems present complicated challenges for public policy. In many respects these challenges are similar to those in other network industries in providing a balance between regulation and markets, public investment and private risk taking, coordination and competition. As with other such industries, naturally monopoly elements interact with potentially competitive services, but electricity has some unusual features that defy simple analogy to other network industries. Following a reversal of a long-term decline in real electricity prices, the last two decades of the twentieth century were for the United States a time of reform, reaction, and reforms of reforms in electricity systems, moving slowly towards greater reliance on competition and markets. Changing technology, new entrants in the generation market, and a legislative mandate to provide access to the essential transmission facility accelerated a process that required major innovations in institutions and operations. Complete laissez faire competition is not possible, and the details of an efficient competitive electricity market are neither obvious nor easy to put in place. The benefits of reform may be substantial, but they require careful attention to market design. A review of the past identifies some choices on the road ahead.

INTRODUCTION

The international experience in restructuring electricity market institutions has been reflected in the many debates and experiments in the United States. The details matter, as is illustrated by examples of both success and failure. A competitive electricity market can be a vehicle for pursuing the public interest, but only if the market structure addresses the particular characteristics of the electricity system with its complex mix of essential facilities and large network externalities. Restructuring is the better term, not deregulation. Electricity is an example of the phenomenon where introducing competition leads not to less regulation, only different regulation.²

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² Steven K. Vogel, Freer Markets, More Rules: Regulatory Reform in Advanced Industrial Countries,

Hence, power markets are made, they don't just happen. Importantly, the rules for access to essential facilities and pricing, to provide consistent and efficient incentives, are not mere technical details that can be deferred or left alone to be discovered through the magic of the market.

The move to greater reliance on markets rests on a belief that the market participants will respond to incentives. Markets with poorly designed institutions have provided the wrong incentives, and market participants have responded. The mistakes, once made, have been costly and difficult to fix. However, the mistakes have revealed what doesn't work. The electricity market reform process in the United States and many other countries may have reached the end of the beginning. By the turn of the millennium, efforts were well underway to move from the initial reforms of regulated markets by introducing competition, to reforms of the reforms to improve the workings of partly competitive and partly regulated markets. In at least one prominent case, California, policy was turning away from market-oriented reforms.

The complete story of electricity restructuring is a complicated matter that covers transition costs and contracts, rent seeking behavior, jurisdictional disputes, market power, and much more.³ To focus the present discussion, the effort is not to describe the full tapestry but rather to identify the threads that relate to the matter of competitive wholesale market design. This design question centers on the complications of transmission and the implications for efficient markets. This design question is important for at least two reasons. First, it makes a big difference:

"The practice of ignoring the critical functions played by the transmission system in many discussions of deregulation almost certainly leads to incorrect conclusions about the optimal structure of an electric power system."⁴

Second, the design challenges that arise from the special nature of electricity transmission are surprising and somewhat counterintuitive. Other problems such as cost recovery, non-discrimination, and retail competition are important, but they lend themselves to more straightforward analysis and have familiar analogues in other industries. By contrast, the special nature of electricity systems leads to the need for a seeming contradiction in terms: coordination for competition. The roots of the electricity market reform policy grow into a discussion of the essential ingredients for competition and the implications for further reforms.

THE ROOTS OF ELECTRICITY RESTRUCTURING

The motivation for electricity restructuring has been slightly different in different countries. In the United Kingdom, for example, privatization of a state owned enterprise reinforced the ideology of the Thatcher government and its interest in reducing the costs of domestic coal subsidies.⁵ Similar ideological and political explanations can be found from Norway to New

Cornell University Press, 1996, p. 3. Willis Emmons, The Evolving Bargain: Strategic Implications of Deregulation and Privatization, Harvard Business School Press, 2000, p. 6.

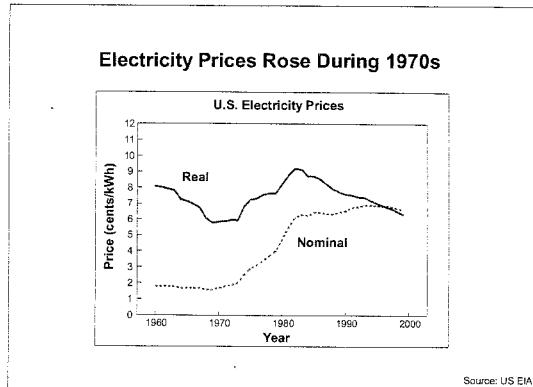
³ Paul L. Joskow, "Deregulation and Regulatory Reform in the U.S. Electric Power Sector," in Deregulation of Network Industries: The Next Steps (S. Peltzman and Clifford Winston, eds.), Brookings Press, 2000.

⁴ Paul L. Joskow and Richard Schmalensee, Markets for Power: An Analysis of Electric Utility Deregulation, MIT Press, 1983, p. 63.

⁵ Willis Emmons, The Evolving Bargain: Strategic Implications of Deregulation and Privatization, Harvard Business School Press, 2000, p. 109.

Zealand. However, there has been a common theme of growing disaffection with the electricity market model of the past and a belief or hope that the success found in "deregulation" of other industries, such as airlines or telephones, could be repeated in the case of electricity production and delivery.

In the United States, the push for restructuring electricity markets accumulated from a number of related factors. The old model, stylized as a vertically integrated monopoly with a regulated franchise, had served the country well for many years. But by the end of the 1960s, the story started to change. Until then, improved technology and further exploitation of economies of scale and scope had meant that electricity could be provided with constant or declining prices, in real and nominal terms. Meanwhile the regulated utilities enjoyed high returns and the quiet life that Hicks described as the best of all monopoly profits. All that



changed in the 1970s. The oil crisis and resulting higher fuel prices, combined with higher inflation, meant that electricity prices would have to be increased to cover costs. With the apparent exhaustion of economies of scale and scope, and greater attention to environmental impacts, new investments, especially in nuclear power, were suddenly more expensive than the existing stock of generating plants. As shown in the figure, the trend in electricity prices reversed in a dramatic way, and prices were up sharply in both real and nominal terms.

The nuclear accident at Three Mile Island punctuated the transition.⁶ By the beginning of the 1980s, disaffection had grown with the electric utility industry and the traditional model of the vertically integrated monopoly. The wheels were in motion for dramatic changes in the industry. The scope and surprise of the problems were captured in the massive 1983 bond default of the Washington Public Power Supply System, WPPSS, ironically known as "Whoops."⁷ Previously unthinkable, these events foreshadowed other financial crises and bankruptcies in the previously stable electric utility industry.

In that same year, Joskow and Schmalensee described both the accumulating disaffection

⁶ On March 28, 1979, the Three Mile Island Unit 2 (TMI-2) nuclear power plant near Middletown, Pennsylvania suffered a partial core melt. Nuclear Regulatory Commission, *Annual Report - 1979*, NUREG-0690, Washington DC.

⁷ In 1983 Washington Public Power Supply System defaulted on \$2.25 billion of bonds due to inability to complete five nuclear reactors. "It was the largest municipal bond default in U.S. history." David Mhyra, *Whoops!/WPPSS: Washington Public Power Supply System Nuclear Plants*, McFarland, 1984, p. 1-2.

with the old utility industry model and the challenges then ahead for "utility deregulation."⁸ Their analysis holds up well in retrospect. While recognizing the failings of traditional regulation, Joskow and Schmalensee analyzed the difficulties of using markets given the complex technology of the electricity system. "The close physical linkages of the components of a modern power system raise serious externality problems."⁹ The authors laid out a series of scenarios, intended to span the range of plausible deregulation scenarios. In the event, their most radical alternative was more conservative than the patterns that emerged in the complicated policy dance as the electricity industry moved towards greater reliance on markets and competition.

A major factor that reinforced the interest in markets grew from an initially obscure element of the Public Utilities Regulatory Policies Act of 1978 (PURPA).¹⁰ As part of a comprehensive effort to address an "energy crisis," PURPA included many elements dealing with conservation and natural gas. Little noticed was the creation of a special class of non-utility generators who could build small power plants and co-generation facilities, known as "qualifying facilities" (QF). Section 210 of PURPA required that traditional utilities purchase electricity from QF facilities at prices set at administrative estimates of the utilities' avoided costs. For many reasons, these estimates of the avoided cost, some set in legislation such as New York's infamous "six cent law," were high enough to produce a market reaction that surprised and almost overwhelmed the regulatory process.¹¹ The original expectation was that QF supplies would be atypical and represent a small fraction of the market. In practice, in the most aggressive states the high administrative prices coupled with the ingenuity of new entrepreneurs who stormed into the market were enough to create a massive problem of excess capacity.

The fallout from PURPA produced many things. Regulators in states as different as California and Maine scrambled to change the rules and lower estimates of avoided costs in order to avoid the new costs they were creating. However, more importantly for the larger restructuring effort in the United States and elsewhere, the unexpected success of PURPA in stimulating new supplies put a stake through the heart of the old view that independent power producers could not provide cost-effective and reliable supplies. Furthermore, the new generating companies became effective at lobbying to put pressure on the system to relax the QF rules and, eventually, to allow independent generators to build power plants without any special restrictions. A new industry emerged.

The opportunities that could be seen in the success of the QFs created a new vision for the electricity market. The idea blossomed that a fully competitive electricity generation industry could

⁸ Paul L. Joskow and Richard Schmalensee, Markets for Power: An Analysis of Electric Utility Deregulation, MIT Press, 1983.

⁹ Paul L. Joskow and Richard Schmalensee, Markets for Power: An Analysis of Electric Utility Deregulation, MIT Press, 1983, p. 41

¹⁰ Public Utilities Regulatory Policies Act of 1978, 16 U.S.C. § 2601 et seq.

¹¹ In 1981, New York law required payment of six cents per kilowatt-hour (\$60/MWh) for QF power; N.Y. Pub. Serv. Law Section 66-c.1. In California, the QF "standard offer" solicitations at avoided costs were so oversubscribed that the California regulators sought coordinated procurement through the "Biennial Resource Plan Update" (BRPU) which required utilities to put their planned new generation out to bid. In the end, the regulators never approved new plant construction in the BRPU proceeding; Southern California Edison Company, et al., (1995) 70 FERC ¶ 61, 215, at p. 61,677. The collapse of the BRPU process played a prominent role in the move to reform regulation in California.

set the framework for the future. Given access to the transmission grid and other essential facilities, these generators could move their power to utilities that would buy in a competitive wholesale market. The term of art for such movement of wholesale power across the territories of multiple utilities was "wheeling." The spirit of the time supporting the introduction of competition was captured in the main title of an important study of the Congressional Office of Technology Assessment (OTA), "Electric Power Wheeling and Dealing."¹² Like with the earlier scenarios of Joskow and Schmalensee, the OTA anticipated competition limited to the wholesale purchases by existing utilities. However, the debate raged on with a great deal of attention as to whether the open competitive market would extend to final customers through "retail wheeling" or be limited to wholesale transactions. The proposal to include retail transactions was opposed by most electric utilities, who lobbied to "just-say-no" to retail wheeling.¹³ The attendant debate diverted attention from more fundamental market design issues.

The reforms in the United States accelerated given the observation of the advance of electricity restructuring in England and Wales. In 1989, the British government launched the restructuring and privatization of the state owned Central Electricity Generating Board to include separation of the ownership and operation of generation, transmission and distribution.¹⁴ The British policy also included eventual extension of competition and choice for retail customers. Similar innovations followed in Norway in 1991.¹⁵ Chile had been the first to launch a major effort to reorganize electricity markets in 1982, but the Chilean model had more influence in Latin America than in England and the United States.¹⁶ There were many sources of reform proposals, and the ideas were in the air.

At the next major transition in the United States, the "just-say-no" utilities appeared to win the battle. The breakthrough legislation in the Energy Policy Act of 1992 (EPAc) explicitly disavowed any extension of open competitive markets to retail customers.¹⁷ However, EPAc included a number of other provisions that ultimately had profound effects. The law expanded the scope of QFs by creating a new class of exempt wholesale generators (EWG), essentially power producers that could be either independent or affiliated with traditional utilities, but would be spared the usual restrictions under the regulations for holding companies.¹⁸ Furthermore, EPAc required utilities to give third parties access to their transmission systems in order to facilitate wholesale

¹² Office of Technology Assessment, United States Congress, Electric Power Wheeling and Dealing: Technological Considerations for Increasing Competition, Washington DC, May 1989.

¹³ The distinctive phrase achieved its original popularity in a campaign against the use of illegal drugs.

¹⁴ The Electricity Act of 1989 set the stage for privatization and launch of the new market and the attendant electricity "Pool" in 1990. David M. Newbery, Privatization, Restructuring, and Regulation of Network Utilities, MIT Press, 1999, p. 202.

¹⁵ David M. Newbery, Privatization, Restructuring, and Regulation of Network Utilities, MIT Press, 1999, p. 246.

¹⁶ Hugh Rudnick, Ruy Varela, and William W. Hogan, "Evaluations of Alternatives for Power System Coordination and Pooling in a Competitive Environment," IEEE Transactions on Power Systems, 1996.

¹⁷ Energy Policy Act of 1992, Public Law 102-486.

¹⁸ Public Utility Holding Company Act of 1935, Public Law 74-333 (PUHCA). The law provides for regulation under the Securities and Exchange Commission, and was an earlier reform designed to restrict the activities of utility holding companies.

trading and competition. Transmission open access, largely still undefined, had become the law of the land.

Eventually, EPAct came to be seen as "...one of the most significant pieces of legislation in the history of the industry."¹⁹ But the initial expectations of the framers of the law were more modest. At the time, non-utilities provided less than 10% of the total production volume, with the vast bulk of electricity production occurring through integrated utilities that sold to their own customers or other utilities.²⁰ The assumption was that this arrangement would more or less continue, allowing for a modest amount of competition at the margin.²¹ The assumption was wrong. The camel's nose was in the tent, and soon the whole camel followed. The introduction of a little competition created pressure for more, and the process moved aggressively to expand the opening that had been created by the small volumes from non-utilities and the requirements of open access to the transmission wires.

The expansion beyond marginal competition flowed from two parallel streams, one in the state efforts to open up retail competition and the other in the implementation of EPAct by the Federal Energy Regulatory Commission (FERC). At the state level, the most prominent initiative was in California, where the California Public Utility Commission (CPUC) responded to a perception of a growing crisis in traditional regulation and sought an alternative in greater reliance on the new EWGs and the forces of competition. The CPUC organized an extensive and extended effort to fashion a restructured industry. The CPUC staff report, known from its cover as the "Yellow Book," concluded that California should reform its regulatory program and offered alternative strategies.²² After further public discussion, the CPUC issued its "Blue Book" plan to substantially reorganize the structure of the industry and its regulation.²³ The subsequent implementing order by the CPUC laid out detailed prescriptions for a new market design.²⁴ The new design borrowed much from the experience with the reforms in England and Wales. The effect of the decisions by the CPUC was to radically alter the nature of the market in California, soon separating generation, transmission and distribution and creating new institutions to coordinate the market. Further, going well beyond the EPAct, California set in motion a plan to open its retail

¹⁹ Energy Information Administration, The Changing Structure of the Electric Power Industry 2000: An Update, DOE/EIA-0562(00), Washington DC, October 2000, p. 33.

²⁰ Energy Information Administration, The Changing Structure of the Electric Power Industry 2000: An Update, DOE/EIA-0562(00), Washington DC, October 2000, p. 117.

²¹ An observation from Congressman Philip Sharp, Chair of the Energy and Power Subcommittee of the House Committee on Energy and Commerce from 1981-95, and a principal author of EPAct.

²² California Public Utility Commission, Decision 92-09-088, W4, 43, "Order Instituting Investigation on the Commission's Own Motion to Implement the Biennial Resource Plan Update Following the California Energy Commission's Seventh Electricity Report," September 16, 1992. California Public Utility Commission, Division of Strategic Planning (DSP), "California's Electric Services Industry: Perspectives on the Past, Strategies for the Future," February 3, 1993

²³ California Public Utility Commission, "Order Instituting Rulemaking on the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation and Order Instituting Investigation on the Commission's Proposed Policies Governing Restructuring of California's Electric Services Industry and Reforming Regulation," Docket Nos. R.94-04-031 and I.94-04-032, April 20, 1994.

²⁴ California Public Utility Commission, Decision 95-12-063 December 20, 1995, as amended y D.96-01-009, January 10, 1996.

markets to competition.

These innovations in California went beyond the scenarios of Joskow and Schmalensee, the scenarios of the OTA, or the expectations of the framers at the time of the passage of the EPAct. Although the story is more complicated than this cursory summary, and the results had different effects in different states, there is little doubt that the California example had a profound impact. It changed the national perception of electricity market reform from one of limited competition at the edges of the wholesale market to full blown separation of the functions of utilities into many independent pieces with unbundled supply and pricing.²⁵

While California was pushing forward its radical proposals, the parallel activities of the FERC expanded the scope and conditions of what would prove to be a critical element of the evolving wholesale market, namely access to the transmission grid. Following an extensive series of paper filings and technical conferences, the FERC issued its transmission open access provisions in Order 888 with its companion information systems mandate.²⁶ The FERC advertised the importance of this landmark order by assigning the identifying number that coincided with the address of its new headquarters in Washington.²⁷ The intent in implementing the principle of open access was to give everyone equal rights to use the transmission grid. The regulatory device would be to require comparability of service. The basic structure of the industry would remain, with vertically integrated utilities, but each utility would be required to provide transmission service in a manner that was "comparable" to the transmission service it provided to itself. In effect, this would separate the transmission function from the rest of the utility. The hope was that non-discrimination would be the key to ensuring the necessary support for the competitive market.

The decisions under Order 888 coupled with the unfolding reforms in California and other states, reinforced by the examples in other countries, soon swept away the more limited scope for competition as anticipated by the framers of EPAct in 1992. By 1996 in the United States, it was clear that to some degree and in some regions, a restructured industry would include retail competition, unbundled services, and complete unpacking of the generation, transmission and distribution activities through either separation of the functions or separation of the companies. The generation and retail supply sectors would be treated as competitive industries. Distribution wires would continue under traditional monopoly franchise regulation. And somehow the essential facility in between – transmission – would be available on an open access basis.

Even if never fully achieved, this more radical scenario presented a problem for the development of electricity markets. The electric system is complex and there are many functions that must be performed but that are unlike the requirements of other industries. Most prominent is the necessity to maintain system balance of supply and demand, moment to moment, given the

²⁵ For a further elaboration of state case studies, see Energy Information Administration, [The Changing Structure of the Electric Power Industry 2000: An Update](#), DOE/EIA-0562(00), Washington DC, October 2000, pp. 82-90.

²⁶ Federal Energy Regulatory Commission, Order No. 888, Docket Nos. RM95-8-000 and RM94-7-001 "Promoting Wholesale competition Through Open Access Nondiscriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities," Final Rule issued on April 24, 1996. "Open Access Same-Time Information System (formerly Real-Time Information Networks) and Standards of Conduct," FERC Order 889, Final Rule, Washington, DC, April 24, 1996.

²⁷ 888 First Street N.E., Washington DC, 20426. The zip code is still available for a future reform.

inability to store electricity at a reasonable cost. Second, understood by electrical engineers but unfamiliar to most others, is the requirement to manage the complex externalities associated with the flow of power across constrained transmission systems. It has long been recognized that some "...pooling and coordination entity will have to be created to serve as an intermediary (both physical and financial) between individual producers of electric power and wholesale consumers (primarily distribution companies)."²⁸ "With large amounts of competitive or unbundled generation ... explicit arrangements for coordinated dispatch and scheduling will be required."²⁹ As unbundling proceeded and competition expanded, the need for some entity performing these functions became ever more obvious.

This necessity was not lost on the FERC. As is its custom, the FERC included in Order 888 a review of the public comments and problem diagnoses. A close reading finds an extensive discussion of the obstacles to electricity markets created by the need for instantaneous balancing and managing the externalities of transmission usage. In particular, the FERC recognized that the traditional power "wheeling" model was built on the fiction of the "contract path."³⁰ In other words, the trading arrangements were based on the assumption that the power could be directed to follow a particular path in the network, in contravention of the accepted physical reality that the power would flow over every parallel path. In the old world of vertically integrated utilities, with small volumes of non-utility production, the contract path was a workable fiction for commercial purposes, and the engineers could deal separately with the physical reality. But in the new unbundled world with a growing volume of third party transactions, the traditional wheeling model would break down. A simple reading of Order 888 shows plainly that the FERC knew all this, but in the end FERC embraced the wheeling model for the expedient reason that it could not reach agreement on an alternative approach for coordinating transmission service.

The evidence of the immediate seriousness of the problems thus created was readily at hand. For example, shortly after the adoption of Order 888, the North American Electric Reliability Council (NERC), the organization responsible for system reliability, recognized that contract-path scheduling created incentives to overload the electric network system. The NERC immediately adopted transmission loading relief protocols to undo the damage whenever the system became constrained.³¹ In essence, NERC created an administrative un-scheduling system to counteract the effects of the FERC-mandated scheduling system.³² The NERC system did not work well.³³ However, something was necessary in order to keep the lights on.

²⁸ Paul L. Joskow and Richard Schmalensee, Markets for Power: An Analysis of Electric Utility Deregulation, MIT Press, 1983, p. 114.

²⁹ Office of Technology Assessment, United States Congress, Electric Power Wheeling and Dealing: Technological Considerations for Increasing Competition, Washington DC, May 1989, p. 133.

³⁰ The contract paths are redefined as "posted paths" in Federal Energy Regulatory Commission, "Open Access Same-Time Information System (formerly Real-Time Information Networks) and Standards of Conduct," Order No. 889, Final Rule, Washington, DC, April 24, 1996, p. 66.

³¹ Rajesh Rajaraman and Fernando L. Alvarado, "Inefficiencies of NERC's Transmission Loading Relief Procedures," Electricity Journal, October 1998, pp. 47-54.

³² Michael Cadwalader, Scott Harvey, William Hogan, and Susan Pope, "Market Coordination of Transmission Loading Relief Across Multiple Regions," Center for Business and Government, Harvard University, December 1, 1998.

³³ Congestion Management Working Group of the NERC Market Interface Committee, "Comparison of

Perhaps the most striking evidence that the problems created by the contract-path approach were both serious and immediate appeared in the words of the FERC itself. Remarkably, on the very day the FERC issued its landmark open access tariff in Order 888, the FERC issued a companion notice of proposed rulemaking for a new transmission capacity reservation tariff (CRT). The notice included the stunning preamble:

"The proposed capacity reservation open access transmission tariff, if adopted, would replace the open access transmission tariff required by the Commission ..."³⁴

Apparently after years of deliberation and mountains of paper, the FERC knew that what it had just wrought would fail, and something else would be required. The proposed capacity reservation tariff would create completely new arrangements for coordinated dispatch and scheduling.³⁵ The CRT proposal received a generally negative review from the industry. It soon disappeared from the FERC agenda. However, as we shall see below, the CRT later reappeared in another guise.

The discussion of the CRT was overtaken by events. Most prominent was the parallel rise of the independent system operator (ISO). The prescient predictions of the earlier analyses of electricity market restructuring were born out by the arrival of new institutions for coordinating system dispatch and use of the transmission grid. Given current electric technology, some such entity is necessary. The question is not whether there should be a system operator, the only meaningful question is what should be rules and protocols that the system operator should follow in support of a competitive market.

The market structures of England and Wales, Norway and many other countries depend on coordination through system operators.³⁶ Following their lead and encouraged by the FERC, new ISOs appeared in California (CAISO), the Pennsylvania-New Jersey-Maryland Interconnection (PJM), New York (NYISO), New England (ISONE), Texas (Electric Reliability Council of Texas-ERCOT), and the Midwest (MISO). More were in the planning stages. The recognition of the limitations of the landmark Order 888, the evident necessity of such coordinating organizations, and the pressing requirements for specifying the rules, transformed slowly into another extended set of hearings and filings at the FERC under the rubric of a new name, the Regional Transmission Organization (RTO). The FERC was asking: what were these ISOs, or RTOs, or Poolcos, or similar entities under a myriad of new names, supposed to do exactly? The FERC then issued a new order with another signature numbering, Order 2000, referred to here as the Millennium Order.³⁷ This order was the CRT born again in greatly expanded form. To develop the implications of these reforms, it is necessary to consider further the requirements for supporting a competitive electricity

System Redispatch Methods for Congestion Management," September 1999.

³⁴ Federal Energy Regulatory Commission, "Capacity Reservation Open Access Transmission Tariffs," Notice of Proposed Rulemaking, RM96-11-000, Washington DC, April 24, 1996, p. 1.

³⁵ Scott M. Harvey, William W. Hogan, and Susan L. Pope, "Transmission Capacity Reservations and Transmission Congestion Contracts," Center for Business and Government, Harvard University, June 6, 1996, (Revised March 8, 1997).

³⁶ For a thorough discussion of the early designs and roles of contracting, see Sally Hunt and Graham Shuttleworth, *Competition and Choice in Electricity*, John Wiley and Sons, 1996.

³⁷ Federal Energy Regulatory Commission, "Regional Transmission Organizations," Order No. 2000, Docket No. RM99-2-000, Washington DC, December 20, 1999.

market.

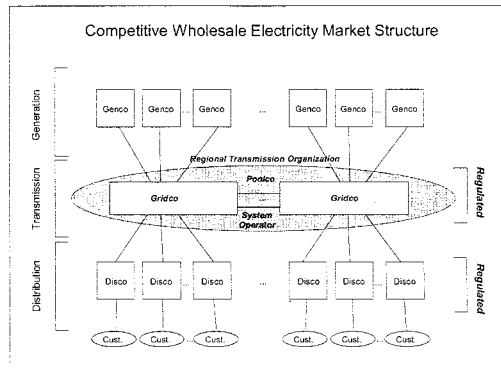
THE ESSENTIAL MARKET INGREDIENTS

Real markets are complicated by imperfections with information asymmetries, transaction costs and market power. The best we can hope for is workable competition. However, even if we assume that buyers and sellers in the wholesale electricity generation market act as pure price takers, the competitive case, the task of market design confronts special difficulties in the circumstances of electricity markets.

The central problem in the development of competitive electricity markets arises from the need for a system operator who can manage the complex short-term interactions in the network and maintain system reliability.³⁸ There must be a system operator. The only open questions are about the rules the system operator will apply and the governance of its activities. Given that the subject is internalizing externalities, there are winners and losers. Given that the subject is complex, it confronts conflicting ideologies. The topic has proven to be highly controversial. Nevertheless, the development of Independent System Operators has proceeded steadily in the worldwide restructuring of electricity markets. There are significant advantages in this approach. Control of the use of the transmission grid means control of the dispatch, at least at the margin, because adjusting the dispatch is the principal (or, in some cases, only) means of affecting the flow of power on the grid.

That this system operator should also be independent of the existing electric utilities and other market participants is attractive in its simplicity in achieving equal treatment of all market participants. The ISO provides an essential service, but does not compete in the energy market.

The process of restructuring wholesale electricity markets in the United States has added to the extensive worldwide debate about the range of possible and preferred alternatives for organizing regional electricity markets. Most importantly, the FERC addressed a wide range of issues in its analysis of and orders for the design of Regional Transmission Organizations. The Millennium RTO Order covers a great deal in fashioning well-designed market institutions to serve the public



³⁸ For expanded version of the argument here, see William W. Hogan, "Regional Transmission Organizations: Millennium Order on Designing Market Institutions for Electric Network Systems," Center for Business and Government, Harvard University, May 2000.

interest.

Surprisingly for an industry as capital intensive as electricity production and distribution, the essential elements are found in a consistent organization of short-run operations and the associated pricing. Difficult or otherwise intractable problems that arise in electricity markets, in both the long run and the short run, disappear or are simplified when the pieces fit together for efficient short-term operations in the context of flexible choices for market participants.

In the short run, there are critical functions that must be performed by someone. The complex network interactions in an electric grid require that there be an entity that can provide certain critical coordinating services.³⁹ But the implications that follow from this fact are so contentious that the discussion often becomes confused and the language strained. Here we focus on the activities of this entity as the system operator, no matter what final name we may give it.

The most obvious example of the essential services is in energy balancing. The electric system must maintain continuous aggregate balance of production and consumption. This same balance of inputs and outputs must be coordinated in a way that respects the many limits in the transmission system. Hence, not only must the aggregate inputs and outputs conform to the electrical laws that govern the interconnected grid, but the locational pattern of power production and use must honor these same laws in order to manage the flow of power within the limits of the transmission system.⁴⁰ Simultaneously, in order to maintain reliability within the security limits of the grid, various ancillary services such as spinning reserve and reactive support need close coordination and monitoring.

This coordination function is not optional. It appears in every electric system. It must be provided. And the services must be integrated with each other. The needs for reactive power and spinning reserve depend importantly on the overall pattern of power production and use. Individual market participants can produce individual elements of these services, but the fundamental coordination function requires a single entity. This is the responsibility of the system operator. And there is always a system operator.

Since the functions of the system operator are not optional, the only open question for market design is how these functions will be performed. The system operator could do a good job, meaning operating efficiently to support a competitive market. Or the system operator could do a bad job, providing the services in a way that increases costs and undermines the competitive market. The central effect of policy should be to require good design for the functions of the system operator.

A central problem appears in designing the design process. Experience indicates that reliance on voluntary agreements among market participants is not likely to be successful. Some problems, like dividing the pie, are largely political and voluntary agreement would be natural. But other problems, like designing bridges, dictate a need for careful consideration of how the pieces fit together and what is in the public interest. Electricity market design is more like the latter than the former. The Millennium Order responds to the need for coherent design that recognizes the complexity of electricity markets.

³⁹ RTO Order, p. 270. See also, William W. Hogan, "Independent System Operator: Pricing and Flexibility in a Competitive Electricity Market," Center for Business and Government, Harvard University, February 1998.

⁴⁰ RTO Order, pp. 423-424.

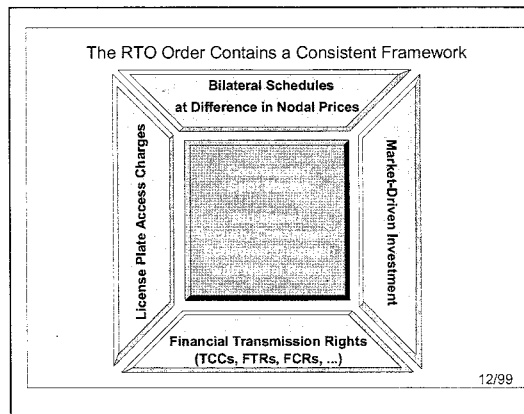
The example of energy balancing illustrates the point. Energy balancing and congestion management are inextricably intertwined. The best approach is to run the balancing and congestion management market as a bid-based, security-constrained economic dispatch with voluntary participation by generators and loads. The corresponding prices would be consistent with the competitive outcome and would reflect the marginal cost of meeting load at each location.

To do anything else would be to decide on providing the essential coordination services in a way that would be inconsistent with the fundamental goals of electricity restructuring and inconsistent with the basic principle of designing market institutions to support the public interest. As a matter of good public policy, we should not have an interest in market designs that raise costs and decrease the real flexibility of market participants.⁴¹

These same essential ingredients would provide many other benefits. Bilateral transmission schedules of great flexibility and market-responsiveness could be accommodated with the transmission usage price set consistently at the difference in the locational energy prices. There would be no bias between bilateral schedules and the coordinated spot market. The market for ancillary service acquisition and pricing could be integrated simultaneously in the economic dispatch.

From the perspective of design of institutions, the most important theme running through the Millennium Order's discussion of these characteristics and functions is the prominence of markets

as the means for achieving the many goals of electricity restructuring. The key element is in the recognition of the importance of a coordinated spot market. In the Millennium Order this appears principally in the discussion of the balancing market. In particular, "[r]eal-time balancing is usually achieved through the direct control of select generators (and, in some cases, loads) who increase or decrease their output (or consumption in the case of loads) in response to instructions from the system operator."⁴² To be consistent with the competitive market, it is essential that this be through a bid-based, security-constrained economic dispatch: "Proposals should ... ensure that (1) the



⁴¹ Larry Ruff, "Competitive Electricity Markets: One Size Should Fit All," *The Electricity Journal*, November 1999, pp. 20-35.

⁴² RTO Order, p. 635.

generators that are dispatched in the presence of transmission constraints must be those that can serve system loads at least cost, and (2) limited transmission capacity should be used by market participants that value that use most highly."⁴³

Further, the FERC requires that everyone be able to participate in this coordinated spot market, at the efficient, and necessarily locational or nodal, prices: "The market mechanisms must accommodate broad participation by all market participants, and must provide all transmission customers with efficient price signals regarding the consequences of their transmission usage decisions."⁴⁴ In addition, "[t]he Regional Transmission Organization must ensure that its transmission customers have access to a real-time balancing market. The Regional Transmission Organization must either develop and operate this market itself or ensure that this task is performed by another entity that is not affiliated with any market participant."⁴⁵

Efficient Pricing

Efficient pricing is a central feature of a competitive electricity market. It is essential if the benefits of a competitive market are to flow through to customers and other market participants. Pricing that is inefficient, on the other hand, will fail to signal and encourage appropriate levels of consumption and supply or the appropriate levels and locations of new generation and transmission investment.

The standard determinant of competitive market pricing is system marginal cost. This is the simple definition of the market-clearing price where supply equals demand. This production level just balances the marginal benefit of additional consumption with the marginal cost of production. Under the usual competitive assumptions, this textbook market equilibrium condition also provides the welfare maximizing economic outcome, which is the definition of economic efficiency.

The basic textbook model extends to the definition of competitive equilibrium for products across multiple locations. The same criterion applies in finding the economic, or least-cost, dispatch of the power grid given the benefits of consumption or the costs of production at each location.⁴⁶ Using the bids as the representation of these benefits and costs, the corresponding economic dispatch produces the same outcome as a competitive equilibrium. The economic dispatch accounts for system congestion and transmission losses, and thus inherently produces prices that can vary at each location by the combined effect of generation, losses and congestion. These locational prices provide proper signals for the quantity and location of new investment.

As a matter of principle, these locational prices are simply the market-clearing prices based on all the bids and the details of the requirements of network operations. Furthermore, for any given economic dispatch, it is an easy matter to determine these prices based on the bids and

⁴³ RTO Order, pp. 332-333. See also p. 382.

⁴⁴ RTO Order, p. 332. See also p. 743.

⁴⁵ RTO Order, p. 423. See also p. 715.

⁴⁶ F. C. Schweppe, M. C. Caramanis, R. D. Tabors, and R.E. Bohn, *Spot Pricing of Electricity*, Kluwer Academic Publishers, Norwell, MA, 1988.

the system conditions. These locational prices are in use today as an integral part of the market design in many regions.

In addition to defining the market-clearing price at each location, these locational prices provide an immediate and simple answer to the otherwise intractable question as to the appropriate marginal cost or market-clearing price of transmission use. The electric network is complicated, with the power flow dictated by the laws of physics and many system constraints. Tracing the details of transmission flow has proven to be a blind alley that has frustrated attempts to define workable methods of transmission pricing.⁴⁷ But the locational pricing approach that accompanies the coordinated spot market provides an immediate simplification of this difficult problem. In particular, transmission of a megawatt between two locations is physically equivalent to sale at the source and purchase at the destination. In equilibrium, therefore, the market-clearing price determined by the marginal cost of transmission must be the same as the net price for the combined purchase and sale transaction. In other words, the price of transmission between two locations must be just the difference in the locational prices of energy.

Since these pricing conditions are derived from first principles for a competitive equilibrium, any efficient mechanism must produce the same pricing result. It follows, therefore, that the market design requirement for a system operator with a balancing and congestion management system provides an easy solution for the efficient support of a competitive market. Economic dispatch with its locational prices defines the efficient outcome.

This is not a new idea. "Spot pricing (or real-time pricing) is another approach that has been considered for coordinating the output of generators to follow loads. . . . However, a lack of experience with spot pricing leaves significant uncertainties about its practical application."⁴⁸ What is new is the practical experience obtained in many countries that shows such efficient pricing to be at least practical, and perhaps essential.

When the system is constrained, the spot prices create congestion rents reflecting the opportunity cost of the constraints. Similarly, rents arise in pricing transmission losses. An issue then arises as to the best use of these transmission rentals. The basic logic is that the payment should be divorced from the marginal usage decisions, in order to preserve the incentives of efficient pricing. Further, it is intuitive that the proper recipients of the rentals should be those who are paying the transmission access charges to cover the fixed costs of the grid. This logic is consistent as far as it goes. However, as we shall see, a superior use of these rentals is in funding long-term transmission rights.

⁴⁷ William W. Hogan, "Flowgate Rights and Wrongs," Center for Business and Government, Harvard University, August 2000. Larry E. Ruff, "Flowgates, Contingency-Constrained Dispatch, and Transmission Rights," *Electricity Journal*, Vol. 14, No. 1, January/February 2001, pp. 34-55.

⁴⁸ Office of Technology Assessment, United States Congress, *Electric Power Wheeling and Dealing: Technological Considerations for Increasing Competition*, Washington DC, May 1989, p. 133.

Long-Term Transmission Rights

With changing supply and demand conditions, generators and customers will see fluctuations in short-run prices. Changing flows will produce changes in losses. When demand is high, more expensive generation will be employed, raising the equilibrium market prices. When transmission constraints bind, congestion costs will change prices at different locations.

Even without transmission congestion constraints or significant changes in losses, the spot market price can be volatile. This volatility in prices presents its own risks for both generators and customers, and there will be a natural interest in long-term mechanisms to mitigate or share this risk. The choice in a market is for long-term contracts.

Traditionally, and as is seen in many other markets, the notion of a long-term contract carries with it the assumption that customers and generators can make an agreement to trade a certain amount of power at a certain price. The implicit assumption is that a specific generator will run to satisfy the demand of a specific customer. To the extent that the customer's needs change, the customer might sell the contract in a secondary market, and so too for the generator. Efficient trading in a secondary market would guarantee equilibrium and everyone would face the true opportunity cost at the margin.

However, this notion of specific performance stands at odds with the operation of the short-run market for electricity. To achieve an efficient economic dispatch in the short-run, the dispatcher must have freedom in responding to the bids to decide which plants run and which are idle, independent of the provisions of long-term contracts. And with the complex network interactions, it is impossible to identify which generator is serving which customer. All generation is providing power into the grid, and all customers are taking power out of the grid. It is not even in the interest of the generators or the customers to restrict their dispatch and forego the benefits of the most economic use of the available generation. The short-term dispatch decisions by the system operator are made independent of and without any recognition of any long-term contracts. In this way, where the disconnect between operations and contracts is not only feasible but necessary, electricity is not like other commodities.

This dictate of the physical laws governing power flow on the transmission grid does not preclude long-term contracts, but it does change the essential character of the contracts. Rather than controlling the dispatch and the short-run market, long-term contracts focus on the problem of price volatility and provide a price hedge not by managing the flow of power but by managing the flow of money. The short-run prices provide the right incentives for generation and consumption, but create a need to hedge the price changes. Recognizing the operation of the short-run market, there is an economic equivalent of the long-run contract for power that does not require any specific plant to run for any specific customer.

Consider the case first of no transmission congestion and no losses. In this circumstance, it is possible to treat all production and consumption as at the same location. Here the natural arrangement is to contract for differences against the equilibrium price in the market. A customer and a generator agree on an average price for a fixed quantity, say 100 MW at \$50 per megawatt-hour (MWh). On the hour, if the spot price is \$60, the customer buys power from the spot market at \$60 and the generator sells power for \$60. Under the contract, the generator owes the customer \$10 for each of the 100 MW over the hour. In the reverse case, with the spot price at \$30, the customer pays \$30 to the system operator, which in turn pays \$30 to the generator, but now the customer owes the generator \$20 for each of the 100 MW over the hour.

This then is the familiar "contract for differences (CFD)."⁴⁹ It is a forward contract like those found for other traded commodities but discovered anew for electricity as an innovation in the market in England and Wales. The CFD allows for long-term contracts without direct contract administration by the system operator.

In effect, the generator and the customer have a long-term contract for 100 MW at \$50. The contract requires no direct interaction with system operator other than for the continuing short-run market transactions. But through the interaction with system operator and the coordinated spot market, the situation is even better than with a long-run contract between a specific generator and a specific customer. For now if the customer demand is above or below 100 MW, there is a ready and an automatic spot market where extra power is purchased or sold at the spot price. Similarly for the generator, there is an automatic spot market for surplus power or backup supplies without the cost and problems of a large number of repeated short-run bilateral negotiations with other generators. And if the customer really consumes 100 MW, and the generator really produces the 100 MW, the economics guarantee that the average price is still \$50. Furthermore, with the contract fixed at 100 MW, rather than the amount actually produced or consumed, the long-run average price can be guaranteed without disturbing any of the short-run incentives at the margin. Hence the long-run contract is compatible with the short-run market.

In the presence of transmission congestion and losses, the generation contract is necessary but not sufficient to provide the necessary long-term price hedge. A bilateral arrangement between a customer and a generator can capture the effect of aggregate movements in the market, when the single market price is up or the single market price is down. However, transmission congestion and losses can produce significant movements in price that are different depending on location. If the customer is located far from the generator, transmission congestion might confront the customer with a high locational price and leave the generator with a low locational price. Now the generator alone cannot provide the natural back-to-back hedge on fluctuations of the short-run market price. Something more is needed.

Transmission congestion and losses in the short-run market raise another related and significant matter for the system operator. For example, in the presence of congestion, revenues collected from customers will substantially exceed the payments to generators. The difference is the congestion rent that accrues because of constraints in the transmission grid. At a minimum, this congestion rent revenue itself will be a highly volatile source of payment to the system operator. At worse, if the system operator keeps the congestion revenue, incentives arise to manipulate dispatch and prevent grid expansion in order to generate even greater congestion rentals. System operation is a natural monopoly and the operator could distort both dispatch and expansion. The same would apply to rents on losses. If the system operator retains the benefits from transmission rentals, this incentive would work contrary to the goal of an efficient, competitive electricity market.

The convenient solution to both problems – providing a price hedge against locational congestion differentials and removing the adverse incentive for the system operator – is to redistribute the congestion and net loss revenue through a system of long-run financial

⁴⁹ Sally Hunt and Graham Shuttleworth, *Competition and Choice in Electricity*, John Wiley and Sons, 1996, pp. 119-132.

transmission rights (FTR) operating in parallel with the long-run generation contracts.⁵⁰ Just as with generation, it is not possible to operate an efficient short-run market that includes transmission of specific power to specific customers. However, just as with generation, it is possible to arrange an FTR that provides compensation for differences in prices, in this case for differences in the congestion and marginal loss costs between different locations across the network.

The FTR for compensation would exist for a particular quantity between two locations. The generator in the example above might obtain an FTR for 100 MW between the generator's location and the customer's location. The right provided by the contract would not be for specific movement of power but rather for payment of the price difference. Hence, if a transmission constraint caused the price to rise to \$60 at the customer's location, but remain at \$50 at the generator's location, the \$10 difference would be the congestion rental. The customer would pay the \$60 for the power. The settlement system would in turn pay the generator \$50 for the power supplied in the short-run market. As the holder of the FTR, the generator would receive \$10 for each of the 100 MW covered under the FTR. This revenue would allow the generator to pay the difference under the generation contract so that the net cost to the customer is \$50 as agreed in the bilateral CFD power contract. Without the FTR, the generator would have no revenue to compensate the customer for the difference in the prices at their two locations. The FTR completes the package.

As with the familiar generation contract-for-differences, the FTR leaves undisturbed the marginal incentives for efficient operations. The FTR is defined for a fixed quantity. If actual usage exactly matches this quantity, the FTR provides a perfect transmission price hedge. But if usage exceeds this FTR quantity, there is no hedge for the incremental volume and the full incentive effect of efficient pricing applies. Likewise, if usage should be below the FTR volume, the payment would apply to the full FTR quantity, so the owner would see the proper marginal incentive to reduce transmission use.

These FTRs are equivalent to perfectly tradable physical transmission rights in a system that has parallel flows. Parallel connections increase system reliability, but create otherwise difficult problems in defining and using transmission rights.

If a simple feasibility test is imposed on the FTRs awarded to customers, the aggregate congestion payments received through the spot market will fund the payment obligations under the FTRs. Still, the transmission prices paid and received will be highly variable and load dependent. Only the system operator will have the necessary information to determine these changing prices, but the information will be readily available embedded in all the spot market locational prices. The FTRs define payment obligations that guarantee protection from changes in the transmission rentals.⁵¹

Given the availability of this coordinated spot market and these efficient locational prices,

⁵⁰ All current implementations of FTRs use congestion but not loss rentals. They are also known as Transmission Congestion Contracts (TCC), as in New York, and Financial Congestion Rights (FCR), in New England.

⁵¹ Scott M. Harvey, William W. Hogan, and Susan L. Pope, "Transmission Capacity Reservations and Transmission Congestion Contracts," Center for Business and Government, Harvard University, June 6, 1996, (Revised March 8, 1997).

market participants could schedule bilateral transactions or rely on trade through the spot market. The differences in locational prices would define the opportunity costs of transmission, giving rise to the creation of financial transmission rights.⁵² Payment for the existing grid would appear in part as access charges, including the use of the "license plate" approach with region-specific access charges.⁵³

These are the most important elements. These define the functions of the essential system operator. These are not mere technical details, and they have far-reaching implications for how, and how well, the market works. The rules for access to the limited capacity of the transmission system stand at the core of all other issues.

Market Power

The problem of market power remains as an important policy issue in electricity markets. The discussion here about the essential ingredients for market design addresses the institutions needed to support a competitive generation market. The full treatment of market power is a complex issue. Furthermore, the argument would be that market design is not the best tool for mitigating market power. An examination of the implications of market power would take us too far afield. For the present purposes, recognize that the coordinated spot market design itself will not eliminate market power. Substantial market power would call into question any proposal to rely on markets for generation.

If there is significant exercise of traditional market power through withholding of generation, this has important policy implications. The preferred response would be bid caps targeted at those exercising market power in the short-run and divestiture in the long-run, and this action alone might be sufficient to moderate the average price impacts. However, if the explanation for market problems lies elsewhere, the policy implications would be different. If scarcity and higher costs are the dominant forces, bid caps on large suppliers and divestiture would have little, maybe no, impact on the outcome of prices and production. Most importantly, price caps that appear more justifiable in the presence of traditional market power become exactly the wrong approach in dealing with scarcity.⁵⁴

REFORMS OF REFORMS

The theory of the case for the market design with an efficient coordinated spot market run by the system operator is by now well supported by practical experience. The main ingredients of the coordinated spot market with locational pricing exist in many parts of the world as diverse as Chile and New Zealand, and the combined package with FTRs has been operating successfully in PJM since 1998. The same general design has been adopted in New York,⁵⁵ and embraced as a

⁵² RTO Order, pp. 382-383.

⁵³ RTO Order, p. 524.

⁵⁴ For a further discussion of market power issues, see Scott M. Harvey and William W. Hogan, "On The Exercise Of Market Power Through Strategic Withholding In California," Center for Business and Government, Harvard University, April 24, 2001.

⁵⁵ New York began operation under this market design in November 1999.

reform in New England.

Efficient pricing, in particular, is especially important in markets that allow participant choices. Almost by definition, any approach other than economic dispatch with nodal pricing will produce prices that are not consistent with market equilibrium. Inevitably, this inconsistency will drive the monopoly system operator or grid owner to intervene in the market. The problems that arise when we do anything else are apparent in various experiments where supposed simplifications produced predictable problems. The successes did not come immediately or easily, and success is not found everywhere. There have already been reforms of reforms, and more will follow. However, the outcome is uncertain. The delay in implementing good RTO designs throughout the United States leaves the restructuring process vulnerable. Other countries are still struggling with the core issues. Review of a few prominent cases that go beyond the initial reforms illustrates the general argument.

PJM Interconnection

The debate over transmission usage and transmission pricing in PJM provides a stark illustration of the difficulty and the challenge of market design.⁵⁶ In March of 1997, the FERC approved an interim transmission access and pricing system to operate in conjunction with a real-time spot market coordinated through the PJM ISO. Faced with opposition to a full locational pricing and congestion charging mechanism for actual use of the system, the FERC endorsed the locational approach in principle but adopted temporarily an alternative model based on a single market clearing price (MCP). The MCP approach minimized the importance of transmission congestion and rejected the locational pricing model as too complicated and unnecessary. Instead, the MCP model would treat the entire PJM system as a single zone.

In essence, much like the approach in England and Wales, the MCP model priced all transactions through the spot-market at the "unconstrained" price, based on a hypothetical dispatch. To the extent that the actual dispatch encountered transmission constraints, the MCP model would pay the more expensive generators to run and average these congestion costs over all users.

The model included two other notable features. First, in the face of transmission congestion, the generators that were constrained not to run would be paid nothing, even though they had bids below the "unconstrained" price. Unlike in the case of England and Wales, there was objection to adopting any system that depended on paying generators not to generate power, with the attendant discrimination and perverse incentive effects. Second, market participants had the option to schedule bilateral transactions separately from the bid-based economic dispatch of the ISO, with a separate payment for their share of the total congestion cost. This flexibility to use bilateral transactions or to participate in the coordinated spot market was a major design objective not to be abandoned.

This pricing system is representative of a zonal approach, and has much in common with zonal systems adopted elsewhere in the world.⁵⁷ However, should the system become

⁵⁶ For details, see William W. Hogan, "FERC Policy on Independent System Operators: Supplemental Comments," Federal Energy Regulatory Commission, Docket No. PL98-5-000, Washington DC, May 1, 1998.

⁵⁷ Here the issue is pricing for transmission congestion. The recovery of embedded costs of transmission

constrained, the two exceptional features noted above would create a powerful and perverse incentive. If there were no transmission constraints, there would be no transmission congestion and everything would work as with the locational pricing system. But when congestion appeared, everything would be different. The supporters of the zonal approach argued that the total cost of congestion would be small, summed over the year, and therefore any inefficiencies could be safely ignored.

Ignoring a difference between prices and marginal costs is a safe practice in a regulated world without flexibility and choice. The incentives don't matter and the small costs get lost in the larger system. Inconsistent pricing can work inside the closed black box of the vertically integrated system. But the cost of ignoring a gap between prices and marginal costs in the world of choice can be large indeed. Witness the events when the PJM system became constrained, starting in June of 1997.

The data for a representative constrained dispatch found the marginal cost in eastern PJM at about \$89 per MWh, when at the same time the marginal cost in the west was \$12 per MWh and the "unconstrained" price was approximately \$29 per MWh. The incentives were clear. A customer could buy from the spot-market dispatch at \$29, or it could arrange a bilateral transaction with a constrained-off generator in the west at a price closer to \$12.⁵⁸ The small average congestion cost would be the same either way, and would not affect the choice. The choice, therefore, presented a test for generators.

Faced with these incentives, constrained-off generators passed the test. They quickly arranged bilateral transactions and scheduled their power for delivery, thereby exceeding the transmission limits. This, in turn, required the ISO to constrain the output from some other generator, who would then follow the same direct path to a bilateral schedule rather than sit idle and collect nothing. Soon the ISO had no more controllable generating units with which to manage the transmission constraints. Unable to fix the perverse pricing incentives, the ISO resorted to administrative mechanisms to prohibit bilateral transactions or declare a "minimum" generation emergency during the peak generation period. In effect, while restructuring to facilitate a market, the unintended consequences of superficially simple pricing spawned administrative rules to prohibit the market from responding to the price incentives when they mattered most. Shackled with inconsistent pricing rules, the ISO had to resort to direct preemption of market choices.

The point was made in a dramatic way. The important issue is not the total cost of congestion, which may be small on average. The point is the incentives at the margin when the system is constrained. In designing the rules for transmission pricing and access for a competitive market, it matters little what the rules are for periods when the system is unconstrained. The important question is how the rules deal with the market when the system is constrained. Even if the total cost of congestion might be modest over the year, the gap between \$29 and \$12, or \$89 and \$12, is more than sufficient to get the attention of market participants. Given the margins in this business, they will change their behavior for \$1. And the changes in behavior can substantially affect system operations; in fact, the whole point of electricity

investment through access charges is a separate matter that is amenable to zonal approach.

⁵⁸ [Power Markets Week](#), September 1, 1997, p. 13.

restructuring is that changes in behavior can affect system operations and lead to different patterns of electricity use and investment.

In the locational pricing system, the perverse incentives would not arise. Given the same facts as above, the locational prices would equal the marginal costs. Those customers purchasing power from the spot market in the east would have seen \$89 as the price. True, they could have arranged a bilateral transaction with a generator in the west, paying \$12 for the energy. But they would then face a transmission charge of \$77 (\$89-\$12), making them indifferent at the margin, just as intended. Likewise, customers in the west would pay \$12 and have no incentive to change. Every generator would be producing at its short-run profit maximizing output, given the prices. The market equilibrium would support the necessary dispatch in the presence of the transmission constraints. Spot-market transactions and bilateral schedules would be compatible. Flexibility would be allowed and reliability maintained consistent with the choices of the market participants.

The PJM ISO was fully aware of the perverse incentives of zonal congestion pricing and the problems they created, but without the authority to change the pricing rules it had no alternative but to restrict the market. Faced with this reality, the FERC acted to approve the locational pricing system that became operational in PJM at the beginning of April of 1998. The developing experience should be better understood to avoid the pitfalls of the complicated zonal "simplification." The subsequent successful experience in PJM has demonstrated the practical importance of locational pricing.⁵⁹ The PJM ISO determines locational prices for over two thousand locations every five minutes. Trading hubs are included and the western hub has become a major market center. FTR auctions occur every month. Congestion is common. generators are building where generation is valuable. The PJM system works with both a real-time and a day-ahead market.⁶⁰

New England

There are many ways that things can go wrong. The PJM 1997 experiment with a zonal pricing system collapsed as soon as the system became constrained. Subsequently, New England adopted a similar MCP approach but without the flexibility for participants to self-schedule to counteract dispatch instructions. However, New England found that the one-zone congestion pricing system created inefficient incentives for locating new generation.⁶¹ Faced with uniform pricing, generators preferred to build where costs were low rather than where value was high. To counter these price incentives, New England proposed a number of limitations and conditions on new generation construction. Following the FERC's rejection of the resulting barriers to entry for new generation in New England, there developed a debate over the preferred model for managing

⁵⁹ Two of the original sponsors of the MCP plan, Philadelphia Electric Company and Enron, subsequently became active supporters of the PJM locational pricing market model.

⁶⁰ PJM Interconnection, L.L.C. For further details on the experience in PJM, see William W. Hogan, "GETTING THE PRICES RIGHT IN PJM. Analysis and Summary: April 1998 through March 1999. The First Anniversary of Full Locational Pricing," April 2, 1999, available through the author's web page; and the earlier discussion in the *Electricity Journal*, September 1998, pp. 61-67.

⁶¹ New England Power Pool, 85 FERC Para 61,141 (1998). For a critique of the previously proposed one-zone congestion pricing system, see Peter Cramton and Robert Wilson, "A Review of ISO New England's Proposed Market Rules," Market Design, Inc., September 9, 1998.

and pricing transmission congestion.⁶² One zone was not enough, but perhaps a few would do?

The extended conversation amounted to a complete replay of all the market design issues, going well beyond the issue of congestion alone. In the end, New England proposed to go all the way to a locational pricing system. The revised model included a new coordinated spot market, locational pricing, and financial transmission rights.⁶³ Hence, the ISONE reforms of reforms would produce a market design that is similar to that operating in New York and PJM. The three ISOs then joined with the Ontario market operator in a memorandum of understanding to coordinate the operation of their markets and resolve seams issues.⁶⁴ Subsequently, ISONE and PJM announced an agreement for ISONE to adopt the PJM market design, protocols, and certain software.⁶⁵

New Zealand

In many ways, the New Zealand market design has been at the forefront of best practice. Furthermore, the electricity reform process in New Zealand involved extensive consideration of the essential ingredients of market design and the experience in other countries. The New Zealand electricity market provides fundamental design elements needed to support competition in generation and supply. A key feature of any such market is the use of a coordinated spot market to handle balancing, transmission usage and security requirements. The New Zealand spot market includes a bid-based, security-constrained, economic dispatch with fully locational prices for real-time decisions. The bids summarize the preferences of the market participants and ensure that the final dispatch choices respect those preferences. The security constraints preserve the conditions needed to ensure reliable operations. The principles of economic dispatch define both the traditional engineering practice and the results of a competitive equilibrium. In this regard, the New Zealand model for real-time operations is aligned with the best international practice for a competitive electricity market.⁶⁶

Nevertheless, motivated in large part with concerns over the results of retail competition, New Zealand has reconsidered its reforms and revisited the issues of electricity market design.⁶⁷ There are special issues in New Zealand, particularly its distinctive attempt to create regulation

⁶² Federal Energy Regulatory Commission, New England Power Pool Ruling, Docket No. ER98-3853-000, October 29, 1998.

⁶³ ISO New England, "Congestion Management System and a Multi-Settlement System for the New England Power Pool," FERC Docket EL00-62-000, ER00-2052-000, Washington DC, March 31, 2000. The proposal includes full nodal pricing for generation and, for a transition period, zonal aggregation for loads. Federal Energy Regulatory Commission, "Order Conditionally Approving Congestion Management and Multi-Settlement Systems," Docket No. EL00-62-000, June 28, 2000.

⁶⁴ PJM, NYISO, ISONE, IMO Press Release, "Ontario's IMO and U.S. Independent System Operators Sign Agreement To Coordinate Inter-Regional Power System Operations," December 21, 1999.

⁶⁵ PJM, ISONE Press Release, "ISO New England and PJM Interconnection Propose a Standard Market Design for Wholesale Electricity Markets," March 29, 2001.

⁶⁶ For a further discussion, see William W. Hogan, "Regional Transmission Organizations: Millennium Order on Designing Market Institutions for Electric Network Systems," Center for Business and Government, Harvard University, May 2000.

⁶⁷ Ministry of Economic Development of New Zealand, "Inquiry into the Electricity Industry," Report to the Minister of New Zealand, Wellington, New Zealand, June 2000.

without regulators. The latest reform of the reforms was not complete at the end of 2000, but it did give evidence of continuing the process of careful examination of all the pieces and their interdependence. The Government of New Zealand set down principles for reform of the electricity market and development of new regulatory arrangements.⁶⁸ These principles could serve as a model for other countries.

The foremost missing ingredient in the New Zealand wholesale market design is a system of long-term transmission rights. A further extension of the New Zealand design would allow for a connection between short-term operations and long-term contracting by providing FTRs. It is straightforward that the monopoly transmission provider must be the first source of transmission rights. These rights might be tradable in a secondary market, but the fundamental definition, initial award, and ongoing provision of the transmission rights must be handled through the transmission provider. Furthermore, the transmission rights must be made compatible with the operation of the coordinated spot market. The special characteristics of the electricity network complicate the definition and provision of long-term transmission rights. The use of FTRs provides a consistent solution that is both theoretically sound and demonstrated in successful applications.

At the end of 2000, there was common agreement that preserving the best features of the existing New Zealand wholesale market design should be a high priority. Furthermore, there was agreement that extending the model to include FTRs would provide an added tool that would provide mechanisms for hedging transmission congestion costs and incentives for long-term investment.⁶⁹

England and Wales

The case of England and Wales presents an exception and a challenge to the argument developed in this paper. The initial reforms in England and Wales in 1990 were highly influential in subsequent developments in electricity restructuring around the world. The signature element of the model was the introduction of the "Pool" by which the system operator managed a coordinated spot market. The principal difference from the British design and the essential ingredients described above was the reliance on a single zone in place of locational pricing to recognize the effects of transmission congestion. The problems created by this exception were managed through a combination of socialization of the congestion costs and a policy of guaranteeing full access to the grid for all generators. In practice, this meant that generators in certain regions would be paid not to generate power when the system was constrained.

The perverse incentives that flowed from this pricing system created a predictable market response that led to a rapid increase in the cost of managing congestion. This could not be sustained, and the policy response was to provide incentives for the National Grid Company to manage the transmission grid, set locational connection charges, and absorb a fraction of the congestion costs. In effect, this approach reverted to the use of a monopoly with price cap

⁶⁸ Pete Hodgson, Minister of Energy, "Government Policy Statement: Further Development of New Zealand's Electricity Industry," Wellington, New Zealand, December 2000.

⁶⁹ Ministry of Economic Development of New Zealand, "Inquiry into the Electricity Industry," Report to the Minister of New Zealand, Wellington, New Zealand, June 2000, p. 61.

regulation in order to provide incentives to counteract the effects of inefficient pricing presented to the market participants. This left problematic incentives for the location of new generating plant, much as in New England, but on balance the system seemed to be working reasonably well.⁷⁰ This particular solution would be difficult to transport to another country where multiple interconnected system operators would be found with parallel flows, not just one system operator with a few controllable interconnections. In any event, the locational incentive problems remain and "...the costs of inefficient location can be large compared to the benefits of competition."⁷¹

The more persistent problem in England and Wales was the concern over the ability of the relatively few large generating companies to manipulate the pool price.⁷² Although there were some divestitures of existing generating plants and a substantial volume of new construction, the concern remained that the exercise of market power was a problem. Of course, no market is perfect, and different observers might come to different conclusions about the seriousness of the market power problem in England and Wales. However, this is a value judgment, and the British regulator came to the view that something needed to be done about market power and other features of the market design.

The subsequent argument and analysis took an unusual turn, however, when the conclusion emerged that the very design of the British pool and its coordinated spot market facilitated, even caused, the exercise of market power. The argument arose that somehow the formal application of the economic law of one price made it easier to manipulate the market, and the transparency of the pool reinforced this ability.

Thus arrived the New Electricity Trading Arrangements (NETA) for the market in England and Wales.⁷³ The new system is complicated, but the essence is simple. Market participants would be required to arrange bilateral transactions at confidential prices. As always, the desire to rely completely on decentralized trading could not be realized. There is still a need for a system operator providing coordination services. Hence, in the NETA design the old day-ahead pool based on a coordinated spot market with a market-clearing price was replaced by a three-and-a-half-hour ahead balancing system with a complex pricing scheme that features a pay-as-bid mechanism with rules intended to penalize imbalances. In effect, the old coordinated spot market with relatively efficient pricing was replaced with a new coordinated spot market with inefficient and obscure pricing.

A complete analysis of the features of this reform of the reform in England and Wales is beyond the scope of the present paper. However, there is substantial support for the view that the NETA reform premise was misplaced:

"The government believes that the Pool has been biased against coal-fired generators, and that its price-setting rule (all generators are paid the bid of the

⁷⁰ David M. Newbery, *Privatization, Restructuring, and Regulation of Network Utilities*, MIT Press, 1999, pp. 210.

⁷¹ David M. Newbery, *Privatization, Restructuring, and Regulation of Network Utilities*, MIT Press, 1999, pp. 269.

⁷² Catherine Wolfram, "Measuring Duopoly Power in the British Electricity Spot Market," *American Economic Review*, Vol. 89, No. 4, September 1999, pp. 805-826.

⁷³ For details on NETA see the UK regulator: Office of Gas and Electricity Markets, "Balancing and Settlement Code," March 1, 2001.

marginal unit) has inflated the level of prices. In practice, many of the perceived problems in the Pool are the result of market power, not the basic design of the Pool, which is capable of sending the right price signals to generators."⁷⁴

Other economic analyses come to even stronger conclusions that the policy does not hold up under logical scrutiny,⁷⁵ will increase costs,⁷⁶ and should not be followed by the rest of the world.⁷⁷

In any event, this particular reform of reforms is fully supported by the British regulator and was launched in March 2001 after a great deal of preparation and expense. The early days included the expected startup problems. The lights have stayed on, but it is too early to tell much. It will be of great interest to follow the progress of NETA. It is a test of the main argument here. By the analysis above, we would expect the use of inefficient pricing in the spot market to result in greater costs for market participants and substantial unanticipated market behavior. This in turn will produce more, not less, intervention by both the regulator and the monopoly system operator as they then seek to undo what the market has done.

California

The most prominent early death of an electricity reform appears to be a suicide by reckless behavior. At the turn of the millennium, the early promise of the California electricity market reforms unraveled in the cascading collapse of a major market and the worst electricity restructuring policy failure ever seen or even previously imagined. By the end of 2000, a power crisis in California laid bare the dangers of designing a market while ignoring the fundamentals of how power systems operate. A flawed wholesale market and a caricature of a retail electricity market arose in California as the product of a volatile combination of bad economic theory and worse political economy practice.

Bad design outcomes were compounded by bad luck. There had been little addition to generating capacity for more than a decade. Low water reservoirs behind power dams combined with higher natural gas prices and tighter environmental conditions. An unexpected surge in demand from economic growth hit the inefficient market and produced unprecedented price increases. In the event, starting in June 2000 wholesale prices surged and stayed above \$150 per MWh while retail prices for the same energy were limited to approximately \$65. The system soon fell apart, the lights literally began to go out, and "deregulation" was pronounced dead.⁷⁸

⁷⁴ Richard Green's "Draining the Pool: The Reform of Electricity Trading in England and Wales", *Energy Policy*, Vol. 27, No. 9, 1999, p. 515.

⁷⁵ Alex Henney, "The Illusory Politics and Imaginary Economics of NETA," *Power UK*, 85, March 2001, pp. 16-26.

⁷⁶ Bower, John and Derek W. Bunn, "Model-Based Comparisons of Pool and Bilateral Markets for Electricity," *Energy Journal*, Vol. 21, November 3, 2000, pp. 1-29.

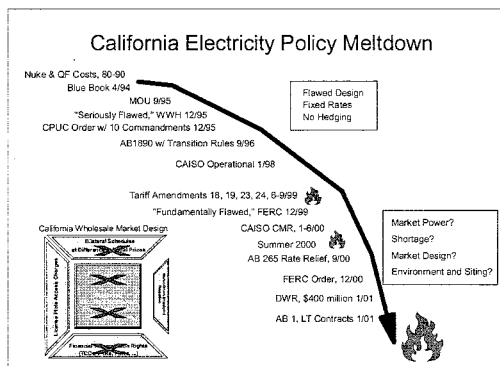
⁷⁷ Catherine D. Wolfram, "Electricity Markets: Should the Rest of the World Adopt the UK Reforms?", *Regulation*, The Cato Institute, Vol. 22, No. 4, 1999, pp. pp. 48-53.

⁷⁸ For a polished review of the elements of the unhappy combination of events, see Bay Area Economic Forum, "The Bay Area - A Knowledge Economy Needs Power: A Report on California's Energy Crisis and its Impact on the Bay Area Economy," April 2001. (www.bayeconfor.org)

A full investigation of this subject would take us far from the main topic.⁷⁹ However, for the subject at hand, California is important because the market was in trouble well before it spun out of control in the summer of 2000. Even without its run of substantial bad luck and exploding prices, the California reform needed reforming, almost immediately.

As the political process took over in 1995, California turned away from the regulator's "Blue Book." Instead,

California built its market design on a flawed premise that the inescapable reality of coordination requirements could be ignored or minimized in an effort to honor a boundless faith in the ability of markets to solve all problems. Worse yet, the design of the California market embraced the notion that what little the system operator would do should be done inefficiently in order to leave even more coordination problems for the market to solve.⁸⁰ This was an unprecedented experiment with a "seriously flawed" market design that did not work in theory.⁸¹ We now know that it did not work in practice either.



California embraced the notion that what little the system operator would do should be done inefficiently in order to leave even more coordination problems for the market to solve.⁸⁰ This was an unprecedented experiment with a "seriously flawed" market design that did not work in theory.⁸¹ We now know that it did not work in practice either.

The bad economic theory was a full embrace of the objective of creating a market for middlemen, no matter what the cost. In California, the approach of a coordinated spot market was explicitly rejected in preference to a complicated trading regime as embodied in the Memorandum of Understanding of 1995.⁸² The subsequent 'ten commandments' from the CPUC

⁷⁹ For an expanded version of this discussion and further references on the California market design failure, see John D. Chandley, Scott M. Harvey, William W. Hogan, "Electricity Market Reform in California," Comments in FERC Docket EL00-95-000, Center for Business and Government, Harvard University, November 22, 2000.

⁸⁰ Steven Stoft, "What Should a Power Marketer Want?," *The Electricity Journal*, 1997, pp. 34-45.

⁸¹ William W. Hogan, "A Wholesale Pool Spot Market Must Be Administered by the Independent System Operator: Avoiding the Separation Fallacy," *Electricity Journal*, December 1995, pp. 26-37.

⁸² "Professor Hogan can also be read to suggest that the ISO should become the 'pool' by taking schedules which include not just quantity information, but also include price information so that the ISO can select 'the most economically efficient' requests from among the schedules, as if the schedules were bids into the pool. This proposal would essentially re-create the pool in the guise of the ISO. Again, there can be no doubt that the parties intended to foreclose this situation. Indeed, the parties went to great lengths in the MOU to allow buyers and sellers to purchase unbundled transmission rights, to make quantity-only schedules, and not to disclose pricing information to the ISO or subject their transactions to 'economic dispatch.'" Enron et al., "Comments of Enron Capital & Trade Resources, Wickland Power Services, Destec Power Services, inc., Ilinova Power Marketing, Inc., Coastal Electric Services, and Electric Clearinghouse, Inc., on the Memorandum of Understanding filed September 11, 1995," dated

attempted to undue these errors,⁸³ but these commandments were ignored in the resulting enabling law AB1890 and the implementation of the market design with the CAISO and a separate Power Exchange (PX). Given the inevitable requirements for coordination, this produced an expanding collection of arcane rules to prevent what was natural by making the coordination process ever harder to use, all in the interest of supporting separate exchanges and marketers. For example, the CAISO was explicitly precluded from providing a least-cost combination of balancing services.⁸⁴ Since the operator still had to provide balancing services, these were required to be inefficient and expensive, in order to create more business for the middlemen. Eventually the CAISO and the PX were operating so many un-coordinated and inconsistent markets for energy and various ancillary services that it was amazing it worked at all.

The compounding failures in the market design accumulated from the market's inception in 1998. Many of the problems that confronted the California ISO and market participants had a common origin in the limitations of the congestion pricing system. California has had essentially a two zone congestion pricing system that was characterized by the existence of considerable intra-zonal congestion, the prospect of additional intra-zonal congestion in the future, and load regions in which high cost generation and transmission investments would be required to meet future load growth. This system has not worked and cannot work in the long-run, because it does not provide generators with the right incentives either with respect to short-run operating decisions or long-run investment decisions.

For example, the constrained-off payment mechanism for managing intra-zonal congestion did not provide generators the right incentives in either the short- or long-run. Generators that were backed down in real time due to intra-zonal congestion received constrained-off payments based on the zonal price. Hence, inefficiently high cost generators would remain in operation, and there was a potential incentive for inefficient entry of new generators requiring additional constrained-off payments. Moreover, there were short-run circumstances in which intra-zonal transmission constraints would create gaming opportunities for individual generators that could schedule transactions in the day-ahead market for which very high constrained-off payments could be extracted in the real-time market.

Amendments 19⁸⁵ and 23⁸⁶ to the CAISO tariff attempted to reduce the potential for inefficient outcomes under the constrained-off payment mechanism by placing a variety of restrictions on generator choices. Rather than correcting the market design flaws, these amendments addressed market imperfections by adding command and control mechanisms that would likely serve as barriers to efficient generation entry in the case of Amendment 19 and

October 2, 1995, and filed with the CPUC, p. 13.

⁸³ California Public Utility Commission, Decision 95-12-063 December 20, 1995, as amended by D.96-01-009, January 10, 1996, Section III, Part 2. See the ten "Principles for Operation of the ISO."

⁸⁴ William W. Hogan, "WEPEX: What's Wrong With Least Cost?" *Public Utilities Fortnightly*, January 1, 1998, pp. 46-49.

⁸⁵ CASIO tariff proposed Amendment 19 Docket No. ER99-3339-000 (New Generator Interconnection Policy), June 23, 1999.

⁸⁶ CASIO tariff proposed Amendment 23 Docket No. ER00-555-002 (Hourly Ex-Post Price), November 10, 1999.

would lead to an inefficient non-market based intra-zonal redispatch in the case of Amendment 23.

The Amendment 19 policy was not new. Essentially the same type of proposal was in place in New England until October 1998.⁸⁷ The policy was defined for similar reasons; namely, to offset the perverse incentives of zonal price aggregation and had the same effect of protecting the incumbent generators. The New England policy was abandoned as inefficient, unfair, and unworkable. As a result, New England revisited the market design issues which created the problem the policy was trying to solve.

At the same time, the CAISO recognized that the pricing system had not drawn forth the necessary level of generation and transmission investment within the transmission constrained areas that include most of the load in California. Hemmed in by its basic design principles, the CAISO sought to remedy the inadequate returns and lack of investment within transmission constrained regions by proposing a process that would govern the distribution of additional extra-market payments to generators within constrained regions (Amendment 24⁸⁸).

Finally, in December 1999, the FERC rejected the ad hoc market adjustments and call for fundamental reform of the zonal congestion management system. "The problem facing the [California] ISO is that the existing congestion management approach is fundamentally flawed and needs to be overhauled or replaced."⁸⁹ By the usual standards of dry FERC prose, this was strong language. There then began an intense process to rethink congestion management, and soon the full market design, from first principles.

It was a race against time. Time ran out. When the bad luck arrived in the summer of 2000, California's Comprehensive Market Redesign (CMR) effort was blown back as the explosive combination of variable wholesale prices and fixed retail prices confronted the spark of a suddenly tight market. Bad luck collided with bad policy. The California government intervened with AB265 to impose retail price caps in San Diego, the one region that had moved to a retail market. The FERC issued a series of orders that reflected a view that the problems must largely be solved in California. The state Department of Water Resources jumped in to buy power for the near or soon to be bankrupt utilities who stopped paying their bills. The state then launched a long-term program, beginning with law AB1, to take over or at least play a prominent role in the electricity market. Even those who predicted problems were surprised at the scope and speed of the policy disaster.

The tragic case of California reinforces the basic argument of the present paper. The magic of the market is no sure thing. The details matter. However, the conditions were so extreme in California that even a good market design may not have survived the summer of 2000 and its aftermath. The outcome of all this was unknowable as the summer of 2001 was about to

⁸⁷ See New England Power Pool, 85 FERC Para 61,141 (1998).

⁸⁸ CAISO tariff proposed Amendment 24 Docket No. ER00-866-000 (Revised Long Term Grid Planning), December 21, 1999.

⁸⁹ Federal Energy Regulatory Commission, "Order Accepting for Filing in Part and Rejecting in Part Proposed Tariff Amendment and Directing Reevaluation of Approach to Addressing Intrazonal Congestion," Docket ER00-555-000, 90 FERC 61, 000, Washington DC, January 7, 2000, p. 9. See also Federal Energy Regulatory Commission, "Order Denying Requests for Clarifications and Rehearing," 91 FERC 61, 026, Docket ER00-555-001, Washington DC, April 12, 2000, p. 4.

begin. But everything would be different after the experience of such a major failure of market restructuring.

CONCLUSION

The developing experience around the world provides insight into the options and implications of alternative models of access to transmission grids in support of an efficient competitive electricity markets. It is argued from this experience that the central wholesale market design requirement is easy access to a coordinated spot market. There are certain critical functions that must be provided by the system operator. When these functions are organized within the framework of a bid-based, security-constrained economic dispatch with locational pricing, the market has the tools available to deal with the most important network complexities that otherwise confound electricity markets. Furthermore, there must be a close connection between the design of options for market flexibility and the pricing principles for actual use of the transmission grid. If prices closely reflect operating conditions and marginal costs, then market participants can have numerous choices in the way they use the transmission system. However, if pricing does not conform to the operating conditions, then substantial operating restrictions must be imposed to preserve system reliability. Customer flexibility and choice require efficient pricing; inefficient pricing necessarily limits market flexibility. As experience develops, the reforms of reforms reveal just how critical are the details of electricity market design, and how they constrain what can be done.

**ON THE EXERCISE OF MARKET POWER THROUGH
STRATEGIC WITHHOLDING IN CALIFORNIA**

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**ON THE EXERCISE OF MARKET POWER THROUGH
STRATEGIC WITHHOLDING IN CALIFORNIA****Scott Harvey and William W. Hogan****EXECUTIVE SUMMARY**

Beginning in June of 2000, the shock of unexpectedly high prices in the California electricity market convinced everyone of the need for policies to correct the apparent market failures. The public debate and policy discussions have been dominated by a focus on market power as a principal problem amenable to regulatory solution. However, design of effective policies to moderate prices or mitigate their effects depends on the diagnosis of the underlying causes. High prices attributable largely to an exercise of market power in electric generation would point to particular market participants and behaviors that could be targeted for regulatory action. By contrast, high prices attributable to bad electricity market design would indicate a need for changes in the design. High prices attributable to higher fuel prices, environmental constraints and capacity shortages, on the other hand, would prompt actions to address the cost of fuel and environmental limitations and indicate that retail loads should receive the appropriate price signal for conservation.

Suppliers could affect market prices by strategically withholding some capacity in order to profit on the capacity actually sold in the market. But charging high prices during periods of scarcity is not classified as exercising market power if there is no strategic withholding of supply. Likewise, refusing to supply without being paid is not an exercise of market power. Although the potential for withholding exists for many suppliers, the focus of attention has been on the exercise of market power by thermal generators in California.

On its face, the experience of extremely high prices suggests that the exercise of market power could be important. But at the same time the data show that there have been profound changes in the California market such that the thermal generators have actually increased their production more than demand has grown. If anything, thermal generators that hit annual output limits produced too much rather than too little in the summer of 2000. Furthermore, the widespread impacts of higher electricity prices throughout the western market, both on and off peak, indicate that if the exercise of market power is important it is occurring to an extent and through channels unprecedented in this or other electricity markets. In short, this is a complicated story, and there is ample room for further investigation of the data and diagnosis of causes.

Examination of the major analyses of the exercise of market power reveals that the estimated magnitude of the possible strategic withholding of electric generation is small enough to make it important to verify the simplifying assumptions. If strategic withholding were large and pervasive, then the real details of the California electricity market could be ignored. But it is by now apparent that the evidence is not clear, and any finding of the presence or absence of strategic withholding of generation in the California electricity market could turn on the simplifying assumptions used in the analysis of the data. For example, annual limits on production dictate that plants should not run in many hours when prices are higher than direct incremental costs; hence, examinations of output decisions for individual hours or months are necessarily incomplete. The variation in real time conditions is large enough to produce

significant reductions in output compared to the expectations given day-ahead prices; hence, with capacity constraints average optimal production is necessarily less than optimal production at average prices. Limits on the ramping rate of generation units, start-up costs, minimum load costs and other operational inflexibilities imply that a dispatch day is not just twenty-four separate hours and must be analyzed chronologically, recognizing these factors. And so on. Accounting for such effects can reverse the implications of the previous evidence. Unfortunately, the real details are neither simple nor incidental.

It is difficult to conduct a study of market power based solely on publicly available data. A fuller analysis would require data available only to the California Independent System Operator, and has not been done. Many factors contributed to higher electricity prices in California, and the market power theme is only, at most, part of the story. The import of the previous analyses is not to prove that market power has been exercised in the California electricity market but, rather, to suggest that it might be important. The import of the sensitivity analysis here is not to prove that market power has not been exercised in the electricity market but, rather, to suggest that it is unlikely to be the dominant factor and may not even be significant. With the available data in the public domain, and the special complications introduced by the California market design, the margin of error in estimating the extent of the possible exercise of market power through strategic withholding of electric generation is of the same order of magnitude as the effect being measured. On balance, to date the publicly available data provides no reason for the Federal Energy Regulatory Commission to change its conclusion that there is no evidence of strategic withholding nor any proof that no strategic withholding has occurred.

By contrast, there is general agreement that the California electricity market design is “seriously flawed.” Furthermore, there is evidence that the policy responses that have been adopted in California have accelerated an already serious market collapse. Hence, without dismissing the possibility of the exercise of market power, the principal policy focus should be on fashioning workable solutions for the other more serious problems in market design that relate to the underlying causes of the market meltdown.

Separate from market power mitigation, California should pay its bills, raise incremental prices to retail customers, and move as quickly as possible to operating a coordinated and efficient market with consistent pricing for all that includes unit commitment, day-ahead scheduling, and real-time balancing. Although not a panacea, these steps would address immediate problems and set the stage for longer-term initiatives to expand generation capacity, transmission infrastructure, and the reach of an efficient market to the western interconnected grid.

**ON THE EXERCISE OF MARKET POWER THROUGH
STRATEGIC WITHHOLDING IN CALIFORNIA**

Scott Harvey and William W. Hogan¹

April 24, 2001

I. OVERVIEW

The continuing high prices in the California electricity market have elicited a sustained interest in understanding the reasons for the high prices. Design of effective policies to moderate prices or mitigate their effects depends on the diagnosis of the causes. For example, high prices attributable to bad market design would indicate a need for changes in the design. High prices attributable largely to an exercise of market power in electric generation would point to particular market participants and behaviors that could be targeted for regulatory action. High prices attributable to higher fuel prices, environmental constraints and capacity shortages, on the other hand, would prompt actions to address the cost of fuel and environmental limitations and indicate that retail loads should receive the appropriate price signal for conservation.

Suppliers could affect market prices by strategically withholding some capacity in order to profit on the capacity actually sold in the market. Hence, market power is defined as the ability to withhold production on some units in order to increase market prices and profit more from production on other units. By contrast, simply charging high prices during periods of scarcity is not classified as exercising market power if there is no strategic withholding of supply.² Likewise, refusing to supply without being paid is not an exercise of market power.

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² Another complication is the possibility of exercising market power by producing too much in order to create system bottlenecks. This is not addressed here. See for instance, Judith B. Cardell, Carrie Cullen Hitt and

It is widely recognized that the potential for exercising market power through strategic withholding exists in electricity markets in many regions of the country, and California is no exception. As a result, policies are already in place to mitigate market power, and market monitoring to detect the exercise of market power is a major and growing activity in restructured electricity markets. For example, in California a number of generating plants have been under Reliability Must Run (RMR) contracts in part to mitigate the exercise of market power. Both the California Independent System Operator (CAISO) and Power Exchange (PX) have had independent external monitoring committees and internal staff devoted to the analysis of market performance.

Of course, no market can be perfectly competitive or perfectly free from some exercise of market power. But there is a legitimate policy concern if strategic behavior by market participants becomes pervasive and significant. With prices exploding starting in about June of 2000, the concern in California has been that market power beyond that resident in owners of RMR plants was both available and exploited to a degree that explained all or a large part of the price increase and apparent supply shortage in the latter half of 2000. Although the potential for withholding exists for many suppliers, the focus of attention has been on the exercise of market power by thermal generators in California. If there has been significant strategic withholding by anyone, including thermal generators, the analysis should identify the responsible parties and the appropriate remedies would be clearer.

On its face, the experience of extremely high prices suggests that the exercise of market power could be important. But at the same time the data show that there have been profound changes in the California market such that the thermal generators have actually increased their production more than demand has grown. Furthermore, the widespread impacts of higher prices throughout the western market, both on and off peak, suggest that if the exercise of market power is important it is occurring to an extent and through channels unprecedented in this or other electricity markets. In short, this is a complicated story, and there is ample room for further investigation of the data and diagnosis of causes.

It is important to understand the reason for the high electricity prices in California, both for developing policies in California and so that the rest of the nation can avoid similar outcomes. It is therefore important to identify the exercise of market power, if it has been an important contributor to these high prices. At the same time, it is important to critically examine the implication that exercise of market power is the dominant explanation for outcomes in California. A conviction that the major problems in the California market arise largely from the exercise of market power in electricity generation could distract from consideration of more fundamental problems. However, if the principal sources of high prices in California lie elsewhere, then a policy preoccupation with market power will lead to choices that exacerbate and prolong the period of high wholesale market prices in California or a broader region.

From this perspective, an important public policy question arises in understanding and testing the data and analyses directed at the estimation of the extent and importance of the exercise of

William W. Hogan, "Market Power and Strategic Interaction in Electricity Networks," Resource and Energy Economics, Vol. 19, 1997, pp. 109-137

market power. If the data indicate that the exercise of market power is a substantial problem in California, then policies to mitigate the exercise of market power in electric generation should be a priority, and may be all that is needed. If, however, the evidence points to the exercise of market power as a secondary concern compared to perhaps market design, environmental limits, gas and generation supply, then the focus of public policy should be different.

The flow of market power analyses is increasing, and the debate is unsettled. The principal conclusion here is that with the available data in the public domain, and the special complications introduced by the California market design, the margin of error in estimating possible exercise of market power in electric generation through strategic withholding is of the same order of magnitude as the effect being measured.³ In this regard, it is unlikely that the exercise of market power is extensive, easy to detect, or easy to correct. By contrast, there is general agreement that the California market design is “seriously flawed.” Hence, without dismissing the possibility of the exercise of market power, the principal policy focus should be on fashioning workable solutions for the other more serious problems in market design.

II. ANALYSES OF MARKET POWER

The accumulation of market power studies is expanding at a rate that is not surprising given the importance of the shock to the California market and, as we shall see, the difficulty of untangling a complicated story. The various studies directed at assessing the role of generator market power in elevating California electricity prices during the year 2000 have reached conflicting conclusions. In some cases, indirect evidence has been found to support an interpretation that there must have been an exercise of market power through withholding; however, the very nature of such indirect analysis precludes the identification of the particular parties who were responsible.⁴ In other instances the analyses found the story to be more complicated, with explanations of the data that either did not indicate the exercise of market power or found the evidence unable to support any conclusion.⁵

As time passes, the horizon for studies assessing the impact of price increases extends correspondingly.⁶ As we move beyond the end of year 2000, there is a need to account for an

³ We have not examined the possible exercise of market power in gas supply, transmission, storage or distribution.

⁴ Frank Wolak, Robert Nordhaus, and Carl Shapiro, “An Analysis of the June 2000 Price Spikes in the California ISO’s Energy and Ancillary Service Markets,” September 6, 2000 (hereafter MSC). Eric Hildebrandt, “Declaration of Eric Hildebrandt,” October 2000 (hereafter Hildebrandt Oct), and Eric Hildebrandt “Analysis of Market Power in California’s Wholesale Energy Markets,” November 21, 2000 (hereafter Hildebrandt Nov).

⁵ Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities, Part I, November 1, 2000 (hereafter Staff Report); Scott Harvey and William W. Hogan, “Issues in the Analysis of Market Power in California,” October 27, 2000 (hereafter Harvey-Hogan); California Power Exchange Corp, Compliance Unit, “Price Movements in California Electricity Markets,” September 29, 2000 (hereafter CALPX); Report on Plant Outages in the State of California, FERC Office of the General Counsel Market Oversight & Enforcement and Office of Markets, Tariffs and Rates, Division of Energy Markets, February 1, 2001 (hereafter FERC Outage Report).

⁶ For example, Eric Hildebrandt, “Further Analyses of the Exercise and Cost Impacts of Market Power in California’s Wholesale Energy Market,” California Independent System Operator, March 2001; Anjali Sheffrin,

increasing accumulation of market failures, including the introduction of credit problems and new price regulations, both of which further complicate the analysis of the market. Nonetheless, as of the end of the first quarter 2001, the more recent analyses had not resolved the uncertainty.⁷ Hence, the focus of the analysis below is restricted to the year 2000, with an emphasis on the data for the Summer of 2000 that has received the most attention.

For the period covering the Summer of 2000, a paper by Paul Joskow and Edward Kahn carries the analysis further than the previous studies in an attempt to move beyond the limitations of indirect detection of an exercise of market power by some anonymous market participant to more directly identify thermal generators that might be withholding output in a strategic exercise of market power that contributed to the high wholesale market prices for electricity in California during the summer of 2000.⁸ The purpose of the analysis below is to carry forward the examination of the market, further discussing the simulation studies and extending Joskow and Kahn's analysis of real-time operating data. The identification of strategic withholding in real time is an important question, and also a difficult question to address, particularly for someone lacking access to the dispatch data. Here we expand our previous discussion to identify some of the issues to be addressed in distinguishing strategic withholding from other causes of high prices, examine further some of the evidence, and suggest some of the policy implications of our current understanding of the state of the market.

It is difficult to conduct a study of market power based solely on publicly available data. On balance, however, we do not see that the evidence to date provides reason for the Federal Energy Regulatory Commission (FERC) to change its conclusion that there is no evidence of withholding nor any proof that no withholding has occurred.⁹ The Joskow-Kahn simulation study improves on certain elements of the earlier MSC study that were likely to understate the competitive price level, but relies on approximations of demand that are likely to understate the competitive price relative to the prior MSC study, and the proxies for hydro and geothermal supply may have the same effect. In addition, the Joskow-Kahn simulation shares limitations with the MSC study regarding the treatment of start-up and no-load costs, non-allowance environmental restrictions, outage rates, uncertainty, and market inefficiency that are likely to cause the simulation to understate the competitive price level.

As Joskow and Kahn note, the data analyzed in their innovative study of real-time withholding does not provide evidence that can distinguish between strategic withholding and other market factors. If the data used in their analysis are adjusted for the hours in which real-time prices were low or units were likely to be ramping, their measure of an output gap is far less, rather than more, than ancillary service procurement, reversing the sign of their principal indicator of

"Empirical Evidence of Strategic Bidding in California ISO Real Time Market," California Independent System Operator, March 21, 2001.

⁷ California Independent System Operator, "Response of the California Independent System Operator (sic) Corporation to Letter Order of March 30, 2001," Submission to Federal Energy Regulatory Commission, April 6, 2001, pp. 2-3.

⁸ Paul L. Joskow and Edward Kahn, "A Quantitative Analysis of Pricing Behavior in California's Electricity Market During Summer 2000," January 2001 (hereafter Joskow-Kahn).

⁹ Staff Report, pp. 1-4, 5-16. FERC Outage Report, pp. 1, 52.

possible strategic withholding. This measure of an output gap is overstated by an indeterminate amount because it does not account for real-time deratings, the impact of intra-zonal congestion, environmental output limits, uncertainty and market inefficiency and may be based on overstated capacities. On the other hand, the relationship between the estimated output gap and ancillary service procurement does not establish that there was no withholding because it is not known how much ancillary services were procured from fossil units not included in the real-time output data (particularly gas turbines) or from hydro or geothermal units. Moreover, a large element of uncertainty is introduced into these comparisons by a lack of information on how replacement and other reserves were actually dispatched by the system operator in real time.

The point of these comments is not that it is impossible to detect economic withholding. Most of the ambiguity arises from a lack of public information on factors that ISOs would routinely take into account in the real-time operation of the transmission system. While it will at times be difficult to distinguish between economic withholding and market inefficiency, or pricing intended to manage limited energy units or environmental constraints, most of the other uncertainties plaguing the analysis of the publicly available data should not hinder identification of withholding from ISO dispatch data.

The import of the Joskow-Kahn analysis is not to prove that market power has been exercised but, rather, to suggest that it might be important. The import of the sensitivity analysis here is not to prove that market power has not been exercised but, rather, to suggest that it is unlikely to be the dominant factor and may not even be significant. By contrast, there appears to be little disagreement that other problems of shortage and bad market design are at least large enough to dictate that the solution requires more than just market power mitigation devices.

An important feature of the Joskow-Kahn study is that it came at a time when it had become reasonably clear that a simple theory of anticompetitive withholding of thermal generating capacity from the California market is not consistent with the events of the year 2000. Since at least November, with the benefit of 20-20 hindsight, it has been apparent that some of the thermal generators suspected of withholding output in the earlier part of the year had actually supplied too much output in the earlier part of the year, causing them to reach annual run time or other environmental limits and to be shut down completely by environmental regulations or restricted to running only in emergency conditions. Generators that have been shut down by environmental regulations for running too long and too hard during this period seem not to have engaged in simple anti-competitive withholding of output. In hindsight, these units were supplying too much output, not too little, during much of the year and should have offered their output at higher prices than they did. In light of this evidence, it is not sufficient in establishing the existence of anticompetitive withholding to demonstrate that particular generators were providing less output than their design capacity in high-priced hours. We are reminded that when cumulative constraints are binding, were it not for the constraint, generators would have an interest in producing more at lower prices. A theory of anticompetitive withholding must demonstrate that thermal generators with cumulative output constraints offered too much output at too low prices in some hours and too little output at too high prices in other hours, and did so in a manner that predictably increased profits. This is a much more complex analysis than any that has been undertaken.

III. ANALYTICAL ISSUES

It is difficult in many industries to clearly distinguish price increases arising largely from the exercise of market power from price increases arising from other changes in market conditions. A number of unique features of the California electricity market, such as one-part bids, and separate non-cooptimized markets for energy, ancillary services and congestion management, greatly complicate assessment of competitive behavior in the California electricity market, making the task more difficult than usual.

Moreover, in analyzing performance in the California electricity market it is important to recognize that a demonstration that the observed outcomes are inconsistent with those in an efficient competitive market does not necessarily imply that the market is not operating competitively; the market may simply be clearing very inefficiently as a result of the market design. The California market design explicitly prevented the central market operator, the CAISO, from coordinating efficient markets for energy, ancillary services or congestion management, and it has been widely predicted that the result would be inefficient market outcomes and higher costs to consumers.¹⁰ While the large increases in wholesale market prices are a subject of public policy concern regardless of the source of these increases, in prescribing remedies it is important to understand whether the principal cause of price increases has been the exercise of market power, poor market design, changes in market conditions or other elements of public policy. Prescribing remedies based on the presumption that the price increases arise solely or largely from the exercise of market power will only prolong the agony if the actual source of the problem lies elsewhere.

The marginal cost of electric generators in California depend on several factors, including heat rates (Btu/kWh), the cost of fuel (e.g., oil or gas), NOx allowance costs and variable O&M costs. As any of these factors increase, the marginal cost of the generator will increase.¹¹ At historic fuel and allowance cost levels the incremental cost of a GT of the type assumed by FERC in its proxy price analysis (18,073 Btu/kWh, 2 lbs. NOx/MWh, \$2/MWh O&M) would have

¹⁰ See, for example, William W. Hogan, "A Wholesale Pool Spot Market Must Be Administered by the Independent System Operator: Avoiding the Separation Fallacy," *Electricity Journal*, December 1995; Steven Stoft, "Analysis of the California WEPEX Applications to FERC," October 8, 1996; Steven Stoft, "California's ISO: Why Not Clear the Market," *Electricity Journal*, December 1996; Eric Woychik, "California's Schedule Coordinator: Market Maker with Advantage," November 26, 1997; William W. Hogan, "Rethinking WEPEX: What's Wrong with Least Cost?" *Public Utilities Fortnightly*, January 1, 1998; Steven Stoft, "Gaming Intra-Zonal Congestion in California," March 6, 1998; Larry Ruff, "Separation of the ISO from the Power Exchange: Some Structural and Operational Implications," October 25, 1995. Larry Ruff, "The California PX Auction: Whatever Happened to the ISO and Why Should Anybody Care," UC Power Conference, March 10, 1997; Richard O'Neill, "Rules and Institutions for Imperfect Markets," Harvard Electricity Policy Group, January 10, 1997; Charles R. Imbrecht, Statement before the Senate Select Committee on Business Development, November 29, 1995; and Charles R. Imbrecht, Statement before the FERC, Technical Conference on the WEPEX Applications, August 1, 1996.

¹¹ FERC uses these factors in setting its California proxy price, see FERC, Order Directing Sellers to Provide Refunds of Excess Amounts Charged for Certain Electric Energy Sales During January 2001 or Alternatively, to Provide Further Cost or Other Justification for Such Charges, March 9, 2001, Docket No. EL00-95-017 et al.

incremental costs in the range of \$58/MWh).¹² At prices of \$10/Mmbtu for gas and \$40 for allowances, the incremental cost of electricity would be in the vicinity of \$262/MWh.¹³

There are at least four general approaches that could be taken to address questions of withholding and market power in the California electricity market. One approach would be to test directly whether particular thermal generating capacity has been anticompetitively withheld from the day-ahead market. A second more indirect approach would be to simulate the competitive level of day-ahead prices and compare them to actual day-ahead prices. A third direct approach would be to test whether particular thermal generating capacity has been anticompetitively withheld from the real-time market. A fourth and again indirect approach would be to simulate the competitive level of real-time prices and compare them to actual real-time prices. Within these general approaches, there are additional choices in how these tests would be applied. A fundamental problem in addressing market power issues with any or all of these approaches is that the margin of error may well be larger than the magnitude of the effects that one is attempting to measure. Hence, even with the best of analysis, the policy conclusions may not be clear. Estimates of a small amount of strategic withholding may not be statistically significant, and correcting behavior that produced a small amount of withholding may not have a material effect on prices. What would be relevant from a public policy perspective would be reasonably unambiguous evidence of a large amount of strategic withholding. The difficulties are not insurmountable in principle, and the importance of the questions is sufficient to justify the effort to untangle the various contributions to the observed result of high prices.

The application of any of these approaches to the identification of the exercise of market power requires that the analysis:

- Account for fuel, O&M,¹⁴ and NOx emission allowance costs;
- Account for environmental output restrictions other than NOx allowances, such as water temperature restrictions or annual operating hour or capacity factor restrictions;
- Account for the impact of transmission congestion (inter- and intra-zonal congestion and RMR calls in California);
- Account for capacity used to provide ancillary services (regulation, spinning reserves, 10-minute reserves, and potentially replacement reserves);
- Account for capacity not available due to forced or maintenance outages or unit deratings; and

¹² $18.073\text{mmBtu/MW} * \$3/\text{mmbtu gas} + 1\$/\text{lb. NOx} * 2\text{lb./MW} + \$2/\text{MWh O\&M}$

¹³ $18.073\text{mmBtu/MW} * \$10/\text{mmbtu gas} + 30\$/\text{lb. NOx} * 2\text{lb./MW} + \$2/\text{MWh O\&M}$

¹⁴ Including any extraordinary O&M costs that might be incurred at very high operating levels as a result of increased risk of triggering a partial or unit wide forced outage, or as a result of continued operation of the unit after mechanical failures have occurred. See, for example, FERC Outage Report, pp. 27, 34 and 49.

- Distinguish between the effects of withholding and imperfect foresight and/or market inefficiency.

Under the first approach, the identification of anticompetitive withholding of capacity in the day-ahead market is further complicated by the need to:

- Account for capacity not sold in the day-ahead market because the day-ahead price was below the expected real-time price;¹⁵
- Account for capacity not sold in the day-ahead market because prices in the day-ahead market were not expected to be high enough to recover the start-up and/or minimum-load costs of the unit;
- Account for capacity not sold in the California day-ahead market because the output of that capacity was sold in other WSCC markets; and
- Account for bidding strategies intended to hedge outage risk.

While the application of this first approach requires considerable information, much of this information would be routinely available to an ISO coordinating a day-ahead market. The application of this approach to the California market, however, is made particularly difficult, even for the California ISO, by a number of unique features of the California market. In particular; 1) the California ISO does not operate a day-ahead energy market; 2) the bids into the California day-ahead energy market used for most analyses (i.e., the PX market) are in the form of portfolio bids. These supply offers are not tied to the capacity of any specific unit, and do not include capacity intended to be used to provide ancillary services (which would be separately bid into markets coordinated by the CAISO); 3) both the ISO and PX markets are based on one-part bids; 4) the CAISO does not manage intra-zonal transmission congestion in the day-ahead market and accepts infeasible transmission schedules in the day-ahead market; and 5) the day-ahead markets operated by the PX and ISO have a number of pay-as-bid elements that introduce inefficiencies and bidding incentives that must be distinguished from the exercise of market power.¹⁶

Tests for the exercise of market power based on the simulation of day-ahead prices simplify the task by avoiding the need to account for arbitrage of day-ahead and real-time prices (because the approach attempts to estimate equilibrium day-ahead and real-time prices), but must:

¹⁵ In other markets, such as PJM and New York, suppliers would probably be more likely to use demand bids (internal or external virtual demand bids in PJM and external virtual demand bids in New York) to arbitrage day-ahead and real-time prices than generation bids, to avoid profit reducing distortions in the unit commitment. There is no such incentive to use demand bids for arbitrage under the California market design and the separation of the ISO and PX, and the PX cost allocation rules appear to make it more expensive for generators to use load, rather than supply bids, to arbitrage day-ahead and real-time prices.

¹⁶ Thus, if energy prices in the PX are lower than expected, the day-ahead ancillary services offers may be based on different assumptions regarding the configuration of on-line capacity than those which underlay the portfolio offers into the PX.

- Account for the impact on commitment decisions of start-up and minimum-load costs and other unit characteristics;
- Account for the impact of real-time events (generation and transmission outages, erroneous load forecasts) that raise day-ahead and expected real-time prices relative to simulated prices; and
- Account for the supply and bidding behavior of non-thermal generation, import supply and export demand.

Even with good data and models, simulation studies have a number of limitations in estimating competitive price levels that might be used to identify the exercise of market power. First, it is in practice difficult to calibrate a simulation model to replicate real-world supply and demand patterns (i.e., load variations, generation outages and transmission outages), yet failure to do so can result in differences between real-world and simulated prices that are unrelated to competitive behavior. Second, it is important, but difficult, to accurately model reserve requirements and identify reserve shortages in the simulation. Third, most simulations do not directly account for the effect of supply and demand shocks that occur following the unit commitment decision. Thus, simulation approaches that determine load and outages prior to the unit commitment step and then dispatch the committed units to meet the load will not fully capture the volatility of real-time prices or the impact of expected real-time prices on day-ahead bids and prices. Fourth, it is difficult to model import supply and export demand so as to accurately reflect the prices at which imports are available in relation to internal supply and demand conditions. Fifth, it is difficult to include the effects of inefficient market design in a simulation. Sixth, a full year or more of data would be needed to address the impact of cumulative annual output limits.

The third approach, tests of withholding from the real-time market, can avoid some of the complexities associated with the simulation approach by focusing on real-time economic withholding by on-line units, and can take the unit commitment as given. Still these tests cannot always easily identify physical withholding of the capacity of off-line units.

Finally, simulation models could be applied to the real-time dispatch to test whether actual real-time prices are consistent with the simulated level of prices. Simulating real-time prices is simpler than simulating day-ahead prices because the unit commitment can be taken as given, but otherwise must address essentially the same difficulties noted above with regard to simulations of day-ahead prices.

While all of these tests are at best difficult to apply, ISOs in the course of their real-time dispatch acquire most of the information needed to assess whether there has been substantial economic withholding in real time. Thus, the ISO dispatch data reveals which units were on-line in real-time, which on-line units and off-line quick-start units were using undispached capacity to provide ancillary services (and particularly which units were being dispatched out of merit to maintain 10-minute reserves), and which capacity could not be dispatched because of transmission congestion, generation outages or generation deratings. Moreover, many environmental restrictions on output are in part implemented by the ISO, and are thus accounted

for in the dispatch (such as restrictions permitting the use of some capacity only during various stages of emergency conditions).

Review of the dispatch data would not avoid all complications in identifying economic withholding in real time. First, it would still be necessary to account for the impact of any environmental output restrictions not administered by the ISO. Second, it would be necessary to account for intra-day gas prices and O&M costs associated with operating at high output rates.¹⁷ Third, it would be necessary to distinguish between the effect of market inefficiency and economic withholding.¹⁸ Fourth, other information would be needed to determine whether real-time prices were elevated by physical, rather than economic, withholding.

The task of identifying real-time withholding is much more difficult for those lacking access to real-time dispatch information. Absent such information, it cannot be determined whether undispached capacity was economically withheld, providing ancillary services, constrained down due to transmission congestion, or unavailable due to deratings or environmental output restrictions. Limited to public data, the analyses so far have been incomplete and unable to identify which, if any, of the thermal generators have been consistently withholding capacity in a strategic effort to raise prices above competitive market clearing levels.

IV. EMPIRICAL ANALYSIS OF MARKET POWER

A. Overview

The paper by Paul Joskow and Edward Kahn goes further with public data than any before and attempts to empirically assess whether the exercise of market power contributed materially to the high wholesale market prices for electricity in California during the summer of 2000, using variations on both the second and third approaches discussed above. First, to motivate a more detailed examination of the data they employ a simulation methodology similar to that previously utilized by Borenstein, Bushnell, and Wolak¹⁹ and the MSC, to simulate the competitive level of wholesale prices in California.²⁰ Second, they utilize EPA and WSCC hour by hour output data for individual thermal generators to assess whether economic capacity was withheld from the market in real-time during high priced hours in the June to September 2000 period.²¹

Although the Joskow-Kahn paper takes better account in its simulation analysis of NO_x emission costs than either the BB&W or MSC papers, the analysis faces many of the same limitations as

¹⁷ Some units may incur increased outage risks or additional O&M costs at very high operating levels. Because units rarely operate at these levels, their existence may be uncertain and at least hard to verify.

¹⁸ This would in principle be possible by comparing the degree of economic withholding across otherwise similarly situated firms having large and small shares of the real-time market.

¹⁹ Severin Borenstein, James Bushnell and Frank Wolak, "Diagnosing Market Power in California's Restructured Wholesale Electricity Market," August 2000 (hereafter BB&W).

²⁰ Joskow-Kahn, pp. 10-20.

²¹ Joskow-Kahn, pp. 22-33.

the earlier studies, as well as having some new problems arising from differences in data and methodology. In particular, the Joskow-Kahn study has limitations with respect to accounting for: environmental restrictions other than NOx allowances; intra-zonal congestion and RMR calls; capacity not available due to forced or maintenance outages or deratings; the impact of start-up and no-load costs and operating inflexibilities; the supply of non-thermal generation and imports; the impact of reserve requirements and the distinction between market inefficiency and anticompetitive withholding. The limitations of the data and methodology generally have the effect that the simulation is likely to understate the competitive level of prices, potentially materially so, and thus suggest the presence of anticompetitive economic withholding, even if the market were operating competitively, but inefficiently.

Joskow and Kahn break new ground in attempting to use EPA and WSCC data to go beyond the simulation and assess whether output was economically withheld during June 2000 by examining actual real-time output data rather than simulation results. Again, however, it is seen that the data and methodological approach has a number of limitations that may cause the analysis to identify economic withholding when none is occurring. In particular, the Joskow-Kahn study has limitations with respect to accounting for environmental restrictions other than NOx allowances, capacity not available due to deratings, capacity used to provide ancillary services, and capacity not dispatched because of real-time congestion or balancing requirements. Moreover, the hours in which withholding is identified include hours in which real-time prices were low for all or portions of the hour, accounting for lower output than in hours with high real-time prices. The present paper replicates the Joskow-Kahn analysis of real-time withholding and extends it to address some of these limitations. The revised analysis suggests that there might, or might not, have been material real-time withholding; there are too many unknowns to draw conclusions.

A fundamental problem with both approaches employed by Joskow and Kahn to identify the exercise of market power is that the margin of error in the methodology and data may be larger than the magnitude of the effects we are trying to identify. This does not mean that withholding cannot be identified, the point is rather that these very indirect methods of inferring the existence of economic or physical withholding have a large measure of error relative to the size of the effect. As suggested above, economic withholding that is very difficult to indirectly identify under the Joskow-Kahn, MSC and BB&W methodologies, will often be readily apparent in the dispatch data available to the system operator, particularly in real-time. The dispatch data will reveal which units: were providing reserves or regulation with capacity not dispatched to meet load; were constrained down by the ISO due to congestion; were dispatched down in real-time by the ISO to balance load and generation; or were output limited because they had not been released from environmental output restrictions. Moreover, the dispatch data will reveal what capacity was not dispatched because the capacity was not offered to the system operator (which could reflect outages, environmental restrictions, or physical withholding) and what capacity was not dispatched because it was economically withheld from providing either energy or ancillary services.²²

²² The dispatch data alone, however, will not reveal whether capacity is being physically withheld from the real-time market to exercise market power or because it is not available due to outages; whether capacity is being

B. Price Simulation Analyses

1. Overview

The Joskow-Kahn simulation of day-ahead prices follows the methodology of the BB&W and MSC papers, but provides a much improved simulation of the impact of NO_x allowance costs. The Joskow-Kahn simulation also takes better account of the full ancillary service requirements of the California ISO.²³

Prices in the California electricity market since June 2000 appear to have been importantly affected by the prices for NO_x emission allowances. The South Coast Air Quality Management District (SCAQMD) RTC program caps and reduces NO_x allowances in the Los Angeles region by allocating emission allowances to historical pollution sources and permitting these allowances to be bought and sold in a free market. Although individual allowances are allocated for a one-year period and cannot be carried forward, the RTC program allocates allowances on a January 1 to December 31 cycle to some firms and a July 1 to June 30 cycle to other firms. This provides a degree of inter-temporal flexibility as emission sources on the July 1 to June 30 cycle can buy allowances from emission sources on the January 1 to December 31 cycle if supply is tight for the cycle ending June 30 and sell allowances for use by those on the later cycle if they are long.

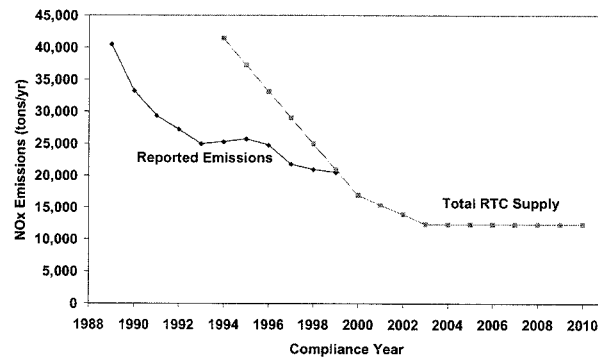
A central fact in understanding California electricity prices during 2000 is that due to a combination of ratcheting down of emission levels (reducing the supply of emission allowances as shown in Figure 1 below) and low hydro conditions resulting in unusually high output levels by thermal electricity generators (see Figure 5 below), emission allowances prices in the SCAQMD region rose far above historical levels.

economically withheld from the real-time market to exercise market power or to allocate limited energy to the highest valued hours; or whether capacity is offered at very high prices because operation of the unit at such high levels carries a significant risk of triggering a forced outage.

²³ The Joskow-Kahn simulation includes in its measure of demand the CAISO demand for capacity to provide all ancillary services, estimated by Joskow and Kahn to be roughly 10 percent of load, rather than only including the capacity used for regulation as in the BB&W and MSC studies (Joskow-Kahn, p. 12). This methodological change would, other things equal, cause the study to identify more hours of shortage during the summer of 2000 than did the MSC study.

Figure 1

RECLAIM NOx Emissions and RTC Supply (tons/year)



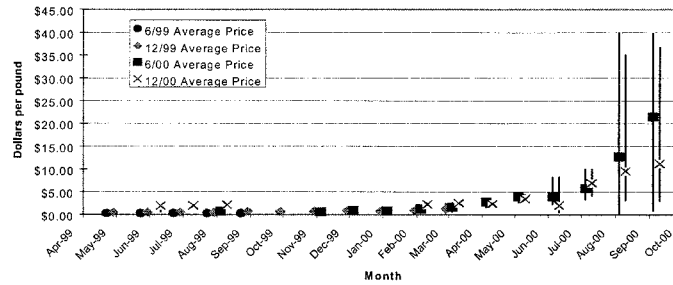
Source: Reproduced from: South Coast Air Quality Management District, Review of RECLAIM Findings, October 20, 2000, p. 1-6 (hereafter RECLAIM Findings).

Unfortunately, while it is clear that emission allowance prices rose (see Figure 2), the nature of the process by which these prices are reported and available to electricity market analysts gives rise to some ambiguity in exactly at what point in time allowance prices rose to exactly what level. The Joskow-Kahn simulation analysis both takes these allowance costs into account and addresses the uncertainty in the time path of allowance prices by simulating electricity prices for a variety of allowance price levels.²⁴

²⁴ Joskow-Kahn, Table 2, p. 16. It is, however, somewhat unclear what emission rates were assumed in calculating these prices. Joskow and Kahn note that the emission rates utilized in their analysis are based on publicly available data and regulatory filings but the data and filings are not identified.

Figure 2

NOx RTC Monthly Average Price Trends



Source: Reproduced from RECLAIM Findings, p. 6-4.

The Joskow-Kahn simulation study also provides an improved modeling of California reserve requirements. Previous simulation studies of day-ahead prices (in particular those of BB&W and the MSC) dispatched generation resources to meet load plus upward regulation requirements. This approach of the previous studies has three limitations. First, this approach would sometimes fail to indicate hours of capacity shortage because the measure of required capacity does not include reserves. Thus, a capacity shortage would exist whenever the available generation resources were insufficient to meet load (including losses) plus upward regulation requirements plus reserve requirements even if there were sufficient capacity available to meet load and provide upward regulation.

Second, this previous approach would also have the potential to understate the cost of meeting load in both shortage and non-shortage conditions because it implicitly assumes that CAISO reserve requirements can be met entirely with undispatched extra-marginal capacity. In practice, however, spinning and 10-minute reserve requirements must be carried on capacity capable of increasing output by the amount of the reserve requirement within ten minutes.²⁵ System operators therefore often find it necessary to reduce output on infra-marginal generators in order to maintain sufficient ramping capability on the units providing reserves such that the reserves could be dispatched within ten minutes in the event of a contingency.²⁶ This reduction in the output of infra-marginal generators correspondingly forces the dispatch of higher-cost extra-marginal generation to meet load. This is illustrated for a very simple market in Table 3. The example assumes that the system operator seeks to carry 60 MW of reserves, that 25 MW can be carried on high-cost hydro and GT units that are not generating and that the remaining 35 MW

²⁵ See WSCC Minimum Operating Reliability Criteria, p. 2.

²⁶ It is important to keep in mind that the main purpose of 10-minute reserves is to maintain the reliability of the transmission system in the event of the sudden loss of a large generator or transmission line.

must be carried on gas units. Column (B) sets forth assumed ramp rates for the gas units and it is seen that the 35 MW of reserves must be carried both on the marginal and infra-marginal cost units. As a result, there is 1,040 MW of capacity on-line to meet 990 MW of load and the market price of energy is \$70/MWh.

	Supply (A)	10-Minute Ramp Rate (B)	Schedules	
			Energy (B)	Reserves (C)
Nuke 1	100 @ 0	0	100	0
Nuke 2	100 @ 0	0	100	0
Cogen 3	100 @ 5	0	100	0
Coal 4	100 @ 17	5	100	0
Gas 5	100 @ 30	10	100	0
Gas 6	100 @ 35	10	100	0
Gas 7	100 @ 35	10	90	0
Import 8	100 @ 40	0	100	
Gas 9	100 @ 5	10	90	10
Gas 10	50 @ 50	5	45	5
Gas 11	50 @ 60	5	45	5
Gas 12	40 @ 70	5	20	5
Gas 13	40 @ 80	5		
GT	10 @ 75	10	0	10
Hydro	15 @ 80	15	0	15
Load = 990 Reserves = 60				

If the prices for this electric system were simulated taking account only of the need to meet load, ignoring reserve requirements, it would be possible to meet load with only 1,000 MW of capacity, as shown in Table 4, and Gas 12 would not be dispatched. The simulated market price of energy would be only \$60/MWh compared to the actual price of \$70/MWh. We do not know the extent to which the need to maintain 10-minute reserve levels in practice requires the CAISO to dispatch higher-cost generation than would otherwise be the case. It is our experience, however, that it would be an unusual on-peak hour in which the need to maintain 10-minute and spinning reserves did not raise the market price of energy in New York. The omission of reserve requirements from the BB&W and MSC analyses is therefore likely to have depressed the simulated prices compared to market prices, at least during peak hours.

Table 4			
Schedule with No Reserve Constraint			
	Supply (A)	Schedules	
		Energy (B)	Reserves (C)
Nuke 1	100 @ 0	100	0
Nuke 2	100 @ 0	100	0
Cogen 3	100 @ 5	100	0
Coal 4	100 @ 17	100	0
Gas 5	100 @ 30	100	0
Gas 6	100 @ 35	100	0
Gas 7	100 @ 35	100	0
Import 8	100 @ 40	100	0
Gas 9	100 @ 45	100	0
Gas 10	50 @ 50	50	0
Gas 11	50 @ 60	40	0
Gas 12	40 @ 70	0	0
Gas 13	40 @ 80	0	0
GT	10 @ 75	0	0
Hydro	15 @ 80	0	0
Load = 990			

The Joskow-Kahn study corrects for these downward biases by modeling load as actual load plus 10 percent to account for reserves plus upward regulation.²⁷ This procedure should correct for the considerations discussed above, permitting the analysis to identify capacity shortage hours and avoid the potential understatement of the market price of energy. In fact, this approach would have the potential to cause the simulation to overstate the competitive market price of energy because it would implicitly assume that all reserves are provided by infra-marginal generation which would also be an inaccurate assumption. Thus, in the example portrayed in Table 4, such an assumption would entail meeting load of 1,050 MW, which would require dispatching the GT at \$75/MWh.²⁸ If we correctly understand the Joskow-Kahn methodology for accounting for reserves, it would eliminate this source of downward bias in the simulation results

²⁷ Joskow-Kahn, p. 12. "We add 10% to each demand level reflecting the CAISO's demand for ancillary services capacity."

²⁸ It is possible that we have not correctly understood the manner in which Joskow and Kahn have adjusted load to account for reserves but, other things equal, their methodology would tend to cause their simulation to identify more shortage hours than the MSC simulation.

of BB&W and the MSC. The Joskow-Kahn methodology provides a conservative measure of the impact of reserves on the competitive price level. Indeed, this methodology would in general be too conservative.

Joskow and Kahn also utilize a more realistic fuel cost figure (\$5.58/mmBtu or roughly \$32.50/bbl) for oil-fired generation than that apparently utilized in the BB&W and MSC studies.²⁹ This fuel cost is still somewhat on the low side during much of 2000, but is likely within 10 percent of the actual cost during the April to June 2000 period.

The Joskow-Kahn price simulation does not, however, appear to address a number of other limitations of the BB&W and MSC simulation methodology that have been described in a previous paper.³⁰

- Accounting for environmental restrictions, other than NOx allowance costs;
- Treatment of hydro power as price taking;
- Accounting for the impact of transmission congestion;
- Treatment of start-up and minimum load costs;
- Assumed outage rates; and
- Impact of the inefficiency of the California market structure.

Moreover, the Joskow-Kahn price simulation methodology introduces some new sources of error that were not present in the earlier analyses. In particular, the Joskow-Kahn simulation analysis is based on ten monthly load deciles, rather than actual hourly supply and demand, which appears likely to result in downward biased simulations of the average competitive price by reducing the number of shortage hours. The Joskow-Kahn study also allocates each month's internal hydro power to meet load over time based on a set of assumptions rather than the actual supply of hydro power and assumes that geothermal generation is not energy limited. Depending on whether these assumptions under or overstate the supply of hydro power in shortage hours and the magnitude of the overstatement of geothermal energy supply, the methodology may over or understate the competitive price level.

2. Previously Discussed Methodological Problems

Methodological limitations of the BB&W and MSC studies that also appear to apply to the Joskow-Kahn simulation study are briefly summarized below. For a few topics for which the Joskow-Kahn methodology is somewhat different than that applied in the earlier studies, somewhat more discussion is provided.

²⁹ See Harvey-Hogan, pp. 41-43.

³⁰ See Harvey-Hogan.

a) *Environmental Output Restrictions (other than NOx allowance costs)*

The Joskow-Kahn paper provides important improvements on the BB&W and MSC papers in its treatment of NOx allowance costs. Moreover, improved accounting for allowance costs results in simulated prices that are much closer to actual prices in August and September than those simulated by the DMA.³¹ On the other hand, however, the Joskow-Kahn simulation does not account for any of the other environmental limitations that affected output, nor does it account for the impact of NOx limitations in areas without markets for allowances. Two types of environmental restrictions that need to be taken into account in simulating generation output are NOx limitations imposed through annual operating hour or capacity factor limits and water temperature restrictions.

Other NOx Limitations

It is widely known by now that a number of California generating plants are subject to annual restrictions on their hours of operation or their annual capacity factor in order to limit NOx emissions. Plants subject to such restrictions and reaching their limits in 2000 include at least the Reliant's Coolwater 1 unit; Ellwood plant and Mandalay 3 unit; and Mirant's (Southern Energy)³² Potrero 4, 5 and 6 units. AES's Los Alamitos, Redondo Beach and Huntington Beach units were also shut down during November by environmental limits.³³ These units account for roughly 4,000-5,000 MW of capacity.

If the plants subject to these kinds of annual operating restrictions are expected to have little chance of reaching their annual operating limit, the limits would be treated by the unit owner as non-binding and the limits would not affect the unit owner's bidding strategy or California electricity prices. If, however, it is expected that these plants will reach their annual operating limits, then a perfectly competitive firm bidding the output of such plants into the market would include in its bids a premium over the other incremental costs of operating the plants. The purpose of such a premium would be to allocate the output of such output-limited plants to the highest-priced hours (i.e., the hours in which their energy was most valuable).

The clear reality for California in 2000 is that a number of the plants subject to such annual operating limits used up their annual quota of operating hours prior to the end of the year. In some cases, such as Reliant's Mandalay 3 and Ellwood units, mechanisms were eventually worked out to enable the plants to continue operating, for at least a limited number of hours.³⁴ In other cases, plants ceased operation.³⁵

³¹ Joskow-Kahn Table 2, p. 16; Hildebrandt Oct, p. 6 exhibit 1; Hildebrandt Nov, p.6, Table 1.

³² Since Joskow and Kahn completed their study, Southern Energy has changed its name to Mirant. We generally refer to the company as Mirant in this paper, except in the discussion and presentation of Joskow-Kahn output gap findings where we refer to the company as Southern for consistency.

³³ See FERC Outage Report, pp. 8, 19, 32; *MW Daily*, November 22, 2000, p. 2; December 1, 2000, p. 7; and December 8, 2000, p. 8.

³⁴ See, for example, FERC Outage Report, pp. 8, 19, 32.

³⁵ See, for example, *MW Daily*, November 22, 2000, p. 2; December 1, 2000, p. 7; and December 8, 2000, p. 8; South Coast Air Quality Management District Website (aqmd.gov/news).

The Joskow-Kahn study assumption that additional NOx allowances were available to Los Angeles area generators at the South Coast market price would not necessarily be applicable to generators in other regions, which could have either lower or higher incremental costs of acquiring NOx allowances. For example, generating plants in San Diego are also subject to NOx restrictions but there is no established market in which additional allowances can be acquired once the annual allowance is exhausted.³⁶

It is clear in the case of plants that were shut down as a result of exhausting their annual quotas that the competitive offer curve for these plants should include an opportunity cost for using up an annual hour or MW-hour of output. In addition to accounting for the output restrictions on the units that are known to have actually reached their environmental operating limits, a simulation analysis must account for any other environmental limits that would have been reached had the unit operator not included an environmental opportunity cost in its bids so as to conserve the unit's available output. Neither the BB&W, MSC nor Joskow-Kahn studies, however, include such an opportunity cost in their simulations. As a result, these studies would overdispatch the plants subject to such restrictions, resulting in the plants exhausting their annual operating allowance at an even earlier point in the year than was actually the case. This overdispatch of these plants would tend to reduce the price simulated by BB&W, MSC and Joskow-Kahn relative to the actual market-clearing prices,³⁷ but the price decrease would reflect the effect of violating environmental limits, not the impact of competition. Because these studies do not model environmental limits, the effects of environmental limits cannot be distinguished from the exercise of market power.

While it is clearly necessary to account for these environmental output restrictions in a simulation analysis, it is recognized that this is not straightforward in circumstances such as prevailed in California in 2000. First, in a number of instances, plants which reached their limits were allowed to continue to operate, at least to some degree, and sometimes in conjunction with additional payments. In these circumstances, the expectations that would have been held by competitive suppliers regarding the consequences of reaching their environmental operating limits are somewhat uncertain. Should plant owners have acted on the assumption that the operating limits would be relaxed in this manner or should they have anticipated that they would be shut down?

Second, the year 2000 in California was almost certainly one in which thermal plants were utilized more heavily than was anticipated early in the year. California ISO data show that thermal units were not utilized more heavily in aggregate in 2000 than in 1999 until May (see Figure 5 below). Absent foresight of how the year would end, thermal plants subject to environmental operating limits may have been bid into the market with no environmental opportunity cost early in the year, under the expectation that their environmental constraints would be non-binding. Such a misforecast would have required higher environmental adders to be included in bids in later months as the continued low hydro and high-load conditions made it

³⁶ See Comments of Duke Energy North America LLC, November 22, 2000, p. 21.

³⁷ Meaningful simulations would necessarily encompass the period covered by the run-time limitations, which would permit verification that operating the generation facilities as assumed by the simulation would not entail violating environmental run time or capacity factor limits.

apparent that these units would in fact reach their environmental limits unless their running time was carefully allocated.

There is more than one way to model these environmental limits, and reasonable people will likely differ on the most appropriate approach. It may in fact be desirable to simulate prices using a range of approaches to understand the sensitivity of the simulation results to these assumptions. It does seem clear, however, that it is not sufficient to simulate electricity prices for California in 2000 under the assumption that none of these environmental limits existed.

The fact that some of the plants subject to such environmental operating restrictions were actually shutdown during 2000 because they reached their annual operating limit is particularly significant in evaluating the possible exercise of market power. These units reaching their operating limits implies that, rather than anticompetitively withholding their output from the market to raise prices as implied by the BB&W, MSC and Joskow-Kahn methodology, these units actually offered themselves into the market at prices that with the benefit of perfect hindsight we now know without question were too low. Perfectly competitive firms with perfect foresight would have offered the output of these plants into the California market during 2000 in many hours at *higher* prices than those at which the output of these plants was actually offered. The reason for such higher offer prices would be to conserve the annual operating hours of these plants so that the units would not exhaust their ability to run prior to the end of the year. A theory of anticompetitive withholding of capacity that is applied to the capacity that reached its environmental limits must therefore be premised on inefficiently low-priced supply offers in some hours and anticompetitively high-priced supply offers in other hours, resulting in a net increase in profits over the year. The conditions required for such a strategy to be profitable are complex, particularly when there are other energy-limited suppliers in the market who would divert energy supplies from the low-priced hours to the high-priced hours. These conditions are not taken into account in the Joskow-Kahn, BB&W or MSC studies.³⁸

The impact of the annual run time and capacity factor limitations is also important in assessing the impact on California prices of the reduction in imports. Joskow and Kahn analyze the impact on their simulated California electricity prices of the reduction in imports between 1999 and 2000, and include the combined effect of the reduction in imports and the increase in allowance prices.³⁹ The Joskow-Kahn analysis of the impact of reduced imports on electricity prices does not, however, take account of the cumulative impact of sustained reductions in imports on the hours of operation of units subject to environmental restrictions on their annual output.

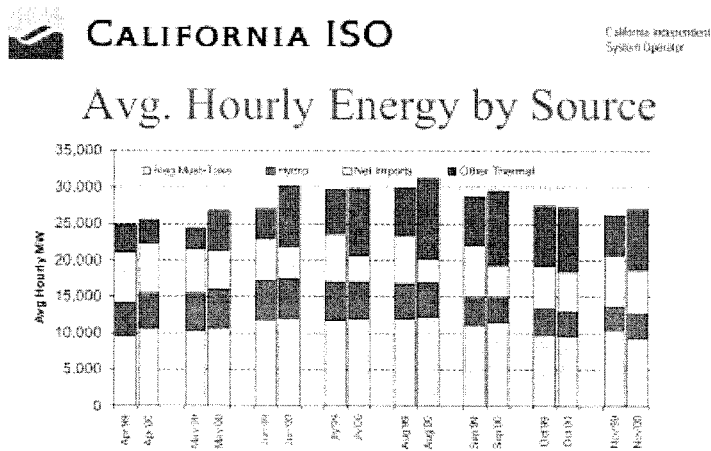
Thus, reduced imports in a particular hour raise electricity prices by forcing the use of higher-cost generation, including generation with higher NOx allowance costs. Reduced electricity imports over the course of the summer also exhaust NOx allowances, driving up the price of

³⁸ Indeed, such a theory does not appear to have been advanced by any study of the exercise of market power in California. Moreover, such a theory could not be tested with publicly available data as a test would at least require access to data on RMR calls, the dispatch of reserves by the ISO, and unit-specific real-time adjustment bid data. Even with such data it would be necessary to somehow distinguish between the exercise of market power, imperfect foresight and the effects of the price caps in accounting for why some units reached their environmental operating limits prior to the end of the year.

³⁹ Joskow-Kahn, pp. 17-18.

NOx allowances, and exhaust the annual operating hours of restricted units, forcing load to be met with higher-cost units, raising prices and inducing conservation or creating shortages. It is clear from CAISO data that the combination of increased demand (insulated from wholesale electricity prices) and reduced imports led to a sustained increase in the output of California's thermal generation that was much larger than the increase in demand alone (see Figures 5 and 24).

Figure 5



November average based on data for November 1-15.

Source: Eric Hildebrandt, "Market Analysis Report," November 30, 2000.

Similar data showing substantially increased output in 2000 on a unit-by-unit basis have also been reported by FERC for a subset of these thermal units.⁴⁰ In considering the effects of the aggregate increase in utilization, it should be kept in mind that some units included in the 1999 output data were not operating at all during June 2000 (such as PG&E's Hunters Point units),⁴¹ increasing the load on the remaining units.

It is also noteworthy in this regard that even with the low import supply elasticity assumed by Joskow and Kahn, their simulation analysis predicts much lower levels of imports,⁴² and thus

⁴⁰ FERC Outage Report, pp. 13, 20, 24, 29, 39, 46.

⁴¹ It should be noted that PG&E as a large net buyer presumably had a substantial financial incentive to maximize the output of its thermal units.

⁴² Joskow-Kahn, pp. 13-14, 37.

much higher operating levels for thermal generators, than those that prevailed in the real world. The supply offers in the simulation would likely therefore cause thermal generators to reach their run time limits even sooner in the simulation than they did in the real world. If this kind of simulation approach is to be applied to the California electricity industry, it needs to be applied over an annual period and the total output in the simulation of each unit subject to environmental restrictions needs to be compared to and validated against the actual environmental limits.⁴³

Water Temperature

Duke's South Bay plant in San Diego is subject to cooling water thermal discharge limits that can limit output.⁴⁴ Mirant's Contra Costa and Pittsburgh plants are subject to environmental restrictions, sometimes referred to as the Delta Dispatch. These restrictions tend to be active from May through about July 15. The restrictions predate Mirant's acquisition of these generating plants and are intended to protect the Delta Smelt, a fish species in the area. The restrictions limit the output and ramp of the Mirant units, with the limits depending on water temperature in the river. The full capacity of these units is only available during this period during local or system emergencies. None of these limits are taken into account in the simulations and the Delta restrictions in particular are in effect during the June period.

Non-allowance environmental constraints affecting the output of the thermal units are a potentially significant factor affecting the supply of energy, and thus California electricity prices, during the summer of 2000. If conclusions are to be drawn regarding the exercise of market power, these limitations need to be taken into account. If these limitations are not taken into account, then the analysis cannot distinguish whether high prices are attributable to the exercise of market power or to the high environmental cost of incremental output.

b) Price Taking Hydro Power

Like the Borenstein, Bushnell & Wolak and MSC studies, the Joskow-Kahn study takes the output of hydro resources as given in defining the competitive supply curve and estimating the competitive market price.⁴⁵ Thus, Joskow and Kahn in effect place the output of hydro resources at the bottom of the supply curve they use to simulate competitive prices. This methodology, however, will cause the simulation to understate the actual competitive price level in any hour in which hydro units were on the margin (i.e., setting prices) in the real world.⁴⁶ Information regarding the frequency of the time that such hydro units were on the margin is apparently not

⁴³ One way to validate the results of such a simulation against environmental output limits would be to compare monthly, and cumulative annual output and run times in the simulation to real-world monthly output and run times from the CEMS data. Such a comparison needs to be made, however, in the context of a chronological simulation model that recognizes generator characteristics such as start-up costs, minimum load levels, minimum down times and minimum run times, as discussed below in Section III.B.2.d.

⁴⁴ See Comments of Duke Energy North America LLC, November 22, 2000, p. 21.

⁴⁵ There are, however, important differences in how Joskow and Kahn and the MSC implement this approach, which are discussed in Section III.C.2 below.

⁴⁶ This potential for understating the competitive price level is discussed at greater length in Harvey-Hogan, pp. 34-35.

publicly available, nor is it known to what extent energy-limited hydro (and geothermal) suppliers used their bids to allocate their energy output to the highest valued hours, but data reported by the California PX showing that many of the high-price bids in the day-ahead market during June 2000 were submitted for IOU resources suggest that this may be a material consideration.⁴⁷

There is also no discussion in the Joskow-Kahn paper of how they handled the output of geothermal units (which are also energy-limited resources and may have used bids to allocate their energy output to shortage hours). If Joskow and Kahn followed the BB&W and MSC methodology, geothermal units would have been treated as price taking as well, which may or may not accurately characterize their bidding strategy and could also cause the simulation to understate the competitive price level.

c) Transmission Congestion

Like BB&W and the MSC, Joskow and Kahn do not attempt to model the impact of transmission congestion on the cost of meeting California load in a competitive market. Instead, they compare the market-clearing price that they estimate, ignoring the effects of congestion, with the hypothetical unconstrained PX price, which is also calculated without regard to the impact of transmission congestion.⁴⁸ While this approach greatly simplifies the analysis, it has implications for the conclusions that can be drawn from the Joskow-Kahn analysis. First, if transmission congestion were expected to exist in real time, then inter-temporal arbitrage by generators, in conjunction with the large amount of load often buying energy in the California real-time market and the segmented structure of California energy and ancillary services markets, would cause thermal generators lacking market power but located in the constrained-up regions to submit PX bids that exceed the unconstrained PX price, but instead approximate the actual zonal PX price and expected real-time zonal price. Thus, if generators in the constrained-up zone bid the expected real-time market-clearing price for that zone into the day-ahead market and their costs into the real-time market, the day-ahead zonal price would be equal to the real-time zonal price in the constrained-up zone. The hypothetical unconstrained price calculated from the day-ahead bids, however, could be higher than a hypothetical unconstrained price

⁴⁷ See CalPX Compliance Unit, Price Movements in California Electricity Markets, August 31, 2000, p. 11 (hereafter CalPX1), and CalPXII, pp. 55-57. It should be kept in mind that because of the structure of the California market, one might actually observe much of the generation offered into the PX market at the expected market-clearing price. It would then be difficult to determine which units were marginal in a cost sense and which units are simply bidding to ensure that they are paid the market-clearing price.

Because most of the internal California hydro resources were owned by utilities that were net buyers during the summer of 2000, one might anticipate that the hydro resource owners would want to avoid submitting bids that would raise the market-clearing price. From such a perspective, the ideal course of action might be to allocate their output to the hours with the highest expected price, bidding it into the market at zero. To the extent, however, that pondage hydro or geothermal resources were bid in to provide reserves and the owners sought to conserve their available energy, the owners would be likely to bid the energy in at high prices, such as \$750/MWh, which would then set the market-clearing price if these resources were dispatched to meet load during shortage conditions.

⁴⁸ Joskow and Kahn do not discuss the impact of transmission congestion or RMR contracts on their analysis. This issue is discussed in BB&W, p. 18.

calculated from the cost-based real-time bids. Recall that sellers are not paid the hypothetical unconstrained price; they are paid the zonal price (or their bid, if dispatched to manage intra-zonal congestion). Thus, in a world with perfect competition and perfect foresight, the unconstrained PX price could exceed the price simulated by Joskow and Kahn in any period in which the NP-15 or SP-15 price exceeded the unconstrained PX price.

A rough assessment of the potential magnitude of the effect of congestion on the unconstrained PX price can be made by calculating the average difference between the unconstrained PX price during June and the price in the constrained-down zone. This difference averaged \$4.37/MWh over June.⁴⁹ This is an upper bound on the impact of the congestion on the calculated unconstrained price and it is clearly both lower than the total price difference simulated by Joskow and Kahn and non-trivial.

A second potential effect of congestion relates to intra-zonal congestion. Until the implementation of Amendment 26 in early 2000, much intra-zonal congestion was managed through the call of RMR contracts, after the close of the PX market. In this non-locational bidding structure, firms lacking market power but having perfect foresight should be expected to bid their capacity into the market at the locational market-clearing price. Firms with locational market power that is mitigated through RMR contracts would, again with perfect foresight, offer their capacity into the market in periods with transmission congestion at the lower of the locational market-clearing price or the mitigated price under their RMR contracts, and would be called by the ISO out of merit at the RMR contract price to meet real-time load. Finally, loads would, with perfect foresight, take these RMR calls into account in bidding into the PX. These effects are recognized by BB&W who note the potential for RMR contract calls to cause the actual PX price to be lower than the simulated PX price curve used in their analysis. The same potential exists in the Joskow-Kahn study.⁵⁰

In practice, neither loads nor suppliers have perfect foresight, but they should be expected to bid so as to attempt to capture the market-clearing price at their location, whether that is the zonal price or a price reflecting the impact of intra-zonal congestion.⁵¹

Although the Joskow-Kahn, BB&W and MSC papers do not discuss the implications of prescheduling of RMR generation subsequent to the implementation of Amendment 26, this system would cause the unconstrained PX supply curve to be lower and to the right of the supply curve estimated by Joskow-Kahn, BB&W and the MSC. Like the other impacts of congestion, the magnitude of the impact of RMR generation on the difference between the actual and simulated price is variable and hard to quantify without reference to data on actual RMR calls.

While it is possible to use publicly available data to place an upper bound on the effect of ignoring inter-zonal congestion as discussed above, no publicly available data exist for intra-zonal congestion or the unit-by-unit level of hourly RMR calls. As a result, neither the

⁴⁹ The difference averaged \$13.06 in congested hours.

⁵⁰ BB&W, p. 29.

⁵¹ Moreover, mistakes arising from the imperfect foresight of real-world suppliers would contribute to the market inefficiency that also raises prices as discussed below.

magnitude nor the direction of the impact of excluding transmission congestion from the analysis can be reliably predicted from publicly available data without abandoning the Joskow-Kahn simulation model and adopting a model that explicitly takes account of transmission congestion.

d) Start-Up and Minimum-Load Costs

Like BB&W and the MSC, the Joskow-Kahn analysis excludes start-up costs, minimum-load costs, and operating parameters such as minimum down times and run times⁵² in defining the simulated competitive supply curve and in simulating the estimated market-clearing price.⁵³ It is a straightforward result of unit commitment logic that when these costs and restrictions exist, it will at times be more efficient to meet load with high incremental cost output from a unit that is already on-line or a high-cost but quick-start unit, than to meet that load by starting a unit with low incremental energy costs but a long start-up time or high start-up costs. While taking account of these costs greatly complicates the analysis, these are real costs that generators must recover in the market price of energy if they are to operate and that, under a one-part bidding system such as in California, will be reflected in the bids of competitive generators.

The impact of ignoring start-up and minimum-load costs would very likely be small on days in which the market was in a shortage situation and prices reached \$750/MWh for many hours, but it could be appreciable over the study period as a whole and even during June on days when prices were well below the price cap. For example, in hour 17 on June 17 the unconstrained PX price was \$125, which according to Joskow and Kahn would have exceeded the incremental running costs of all of the steam units in the CEMS database.⁵⁴ The Joskow-Kahn simulation model would find that all of this generation should therefore have been dispatched to meet load before the price could rise to \$125. Even if their inferences regarding incremental costs were correct, however, it is likely that it would not have been economic to use all of the steam generation to meet load in this hour. The \$125/MWh price was the highest hourly unconstrained PX price in the day-ahead market for June 17. While there were six hours that day during which the unconstrained PX price exceeded \$100, it is unlikely that a steam unit with average running costs of \$110 would have expected to recover its start-up costs (or losses from remaining on overnight at prices that were less than \$40 for hours 2 through 8) by operating at prices only slightly above its running costs for a few hours. Only a unit with average running costs materially below \$120 would have been economic to bring on-line to meet load during June 17.

It is important to understand that these minimum-load costs can be large and can change the apparent profitability of unit operation. For example, Table 6 portrays the apparent profitability of Alamos 2 on June 17 (one of the days during which unconstrained PX prices at times

⁵² Start-up costs are the fuel costs of bringing a generation unit online to meet load. In the case of large gas-fired steam generators, this can be \$100,000 or more. Minimum load costs are the cost of keeping a steam generating unit operating at its minimum operating level in order to have it available to operate at a higher level later in the day.

⁵³ BB&W provide various rationales for their failure to take account of start-up and minimum load costs (BB&W, p. 22), which are discussed in Harvey-Hogan, pp. 14-16 and 38-39. Joskow and Kahn do not provide any rationale for their decision not to take account of these costs.

⁵⁴ Joskow-Kahn, p. 25.

exceeded \$120/MWh), calculated based on the unconstrained PX price, the actual CEMS output,⁵⁵ the incremental heat rate reported in Klein,⁵⁶ and a Southern California gas price of \$4.99 per mmBtu. These approximate the assumptions apparently used in the various simulation analyses. With these assumptions, the unit would appear to earn a margin of nearly \$45,573 for the day, a gross profit margin of nearly 46 percent of its gross revenues.

⁵⁵ It should be kept in mind that the CEMS data reports the gross output of each unit. Some of this electricity output is consumed by the plant itself and therefore does not generate revenues. Tables 6 to 9 below therefore overstate unit margins because they do not include those costs.

⁵⁶ Joel Klein, "The Use of Heat Rates in Production Cost Modeling and Market Modeling," April 17, 1998. 10056 is the incremental heat rate at full output. The incremental heat rate is lower at lower output levels.

Table 6 Alamitos 2 Profitability Incremental Heat Rate and Unconstrained PX Price June 17, 2000						
Hour	Heat Rate (A)	Gross Output MWh (B)	Unconstrained PX Price (C)	Incremental Cost \$/MWh (D)	Margin \$/MWh (E)	Margin \$/Hour (F)
0	10056	10	50.00	50.18	-0.18	-1.79
1	10056	9	38.99	50.18	-11.19	-100.71
2	10056	9	35.76	50.18	-14.42	-129.78
3	10056	9	35.75	50.18	-14.43	-129.87
4	10056	9	35.01	50.18	-15.17	-136.53
5	10056	29	28.01	50.18	-22.17	-642.91
6	10056	37	32.00	50.18	-18.18	-672.64
7	10056	25	37.90	50.18	-12.28	-306.99
8	10056	34	45.01	50.18	-5.17	-175.76
9	10056	53	72.57	50.18	22.39	1186.70
10	10056	56	76.52	50.18	26.34	1475.07
11	10056	56	90.00	50.18	39.82	2229.95
12	10056	57	105.00	50.18	54.82	3124.77
13	10056	94	116.13	50.18	65.95	6199.35
14	10056	122	115.00	50.18	64.82	7908.11
15	10056	124	119.98	50.18	69.80	8655.27
16	10056	107	125.00	50.18	74.82	8005.80
17	10056	63	115.00	50.18	64.82	4083.70
18	10056	38	93.92	50.18	43.74	1662.14
19	10056	34	80.01	50.18	29.83	1014.24
20	10056	48	80.01	50.18	29.83	1431.87
21	10056	19	75.61	50.18	25.43	483.18
22	10056	24	65.00	50.18	14.82	355.69
23	10056	15	53.76	50.18	3.58	53.71
Total All Hours						45572.59
Total Profitable Hours						47869.55
No allowance is made for variable O&M, emission allowance or station costs. Gas Price = 4.99						
Sources:						
(A) Klein						
(B) CEMS						
(C) PX						
(D) (A) * \$4.99/1000						
(E) (C) - (D)						
(F) (E) * (B)						

However, the assumptions of the simulation analyses simplify the problem in important ways. By contrast, Table 7 recalculates the profitability of Alamitos 2 using the actual average heat rate reported in the CEMS data for each hour and the SP-15 PX price. Rather than earning a significant profit, it can be seen that the unit would have lost money had it sold its real-time

output in the PX market.⁵⁷ Part of the difference is attributable to the difference between the actual SP-15 price and the hypothetical unconstrained price, but most of the difference is attributable to the fact that the unit's actual average heat rate was much higher than the incremental heat rate reported in Klein for most of the hours of the day. The unit's output weighted average heat rate was almost 17,000, compared to the incremental heat rate of 10,056 in Klein.

⁵⁷ It should be kept in mind that these tables do not reflect the actual day-ahead revenues of the unit. Profits are calculated in these tables based on real-time output and day-ahead prices. The actual day-ahead schedule of the unit is not known. The tables also do not include any ancillary service revenues that the unit might have earned in the day-ahead or real-time markets.

Table 7 Alamitos 2 Margins – PX Prices and Actual Heat Rate June 17, 2000						
Hour	Heat Rate (A)	Gross Output MWh (B)	SP-15 PX Price (C)	Incremental Cost \$/MWh (D)	Margin \$/MWh (E)	Margin \$/Hour (F)
0	33832.31	10	35.00	168.82	-133.82	-1338.23
1	36213.68	9	30.00	180.71	-150.71	-1356.36
2	36480.34	9	24.02	182.04	-158.02	-1422.15
3	35558.12	9	20.51	177.44	-156.92	-1412.33
4	36258.12	9	19.99	180.93	-160.94	-1448.44
5	20490.45	29	15.00	102.25	-87.25	-2530.17
6	17751.98	37	24.99	88.58	-63.59	-2352.92
7	20660.92	25	22.90	103.10	-80.20	-2004.95
8	18735.97	34	32.02	93.49	-61.47	-2090.07
9	16404.21	53	38.01	81.86	-43.85	-2323.89
10	15736.13	56	70.00	78.52	-8.52	-477.30
11	15666.48	56	74.23	78.18	-3.95	-220.96
12	15810.93	57	82.00	78.90	3.10	176.90
13	14684.29	94	101.13	73.27	27.86	2618.41
14	14206.75	122	113.60	70.89	42.71	5210.42
15	14204.22	124	119.98	70.88	49.10	6088.52
16	14272.18	107	123.60	71.22	52.38	5604.86
17	15224.18	63	113.60	75.97	37.63	2370.78
18	16774.29	38	85.00	83.70	1.30	49.26
19	18068.33	34	75.00	90.16	-15.16	-515.47
20	16900.48	48	74.99	84.33	-9.34	-448.48
21	22101.21	19	52.00	110.29	-58.29	-1107.42
22	22146.79	24	51.30	110.51	-59.21	-1421.10
23	25961.54	15	38.01	129.55	-91.54	-1373.07
Total All Hours		1081				-1724.19
Total Profitable Hours						22119.12
No allowance is made for variable O&M, emission allowance or station costs.						
Gas Price = 4.99						
Sources:						
(A), (B). CEMS						
(C) PX						
(D) (A) * \$4.99/1000						
(E) (C) - (D)						
(F) (E) * (B)						

While incremental heat rates are appropriate for calculating incremental dispatch costs, they are not appropriate for evaluating unit commitment decisions. The unit commitment decision must take into account the average heat rate and costs of a unit, as well as its incremental costs. Bidding strategy is greatly complicated for California generators by the CAISO and PX reliance on one-part bids, but the decision to prevent generators from submitting multi-part bids does not change the underlying economics that will govern the bids of competitive generators. Generators

in competitive markets will submit one-part bids that limit the financial losses arising from uneconomic PX positions. This will entail submitting one-part bids that exceed incremental costs on potentially marginal or extra-marginal units.

The Joskow-Kahn methodology not only likely understates the bid price at which capacity that actually operated in the real-world would be offered to the day-ahead market (because this capacity would lose money on marginal operations in the Joskow-Kahn model) but also likely assumes that capacity that did not operate in the real world because of high start-up and minimum-load costs, would have operated in many additional hours in which the units would have lost money. The Joskow-Kahn simulation methodology implicitly assumes that a steam unit would be available to meet load at incremental cost in each and every hour, even if it was only needed to meet load for a single hour and that the units could be turned off whenever prices made their operation uneconomic, even for a single hour.

Load could indeed be met more cheaply if start-up and minimum-load costs did not exist and units did not have inflexible operating characteristics, but real generators dispatched to meet California load did incur start-up and minimum-load costs and did have operating constraints. These costs and operating constraints raise the cost of meeting load in a competitive market. The effect of these assumptions can also be illustrated using the actual output of Alamos 2 on June 17. It can be seen in Table 8 that even if average heat rates are used to evaluate operating profitability, the operation of Alamos 2 appears highly profitable if it is modeled as being able to turn on whenever prices are high and turn off whenever prices are low. Thus, with this flexibility, it would appear highly profitable to use Alamos 2 to meet load on June 17, earning \$22,119, when in fact the day-ahead prices for energy alone were not high enough to justify operation of Alamos 2 at the levels to which it was actually dispatched.

Thus, if Alamos 2 were not providing ancillary services and submitted cost-based energy bids reflecting the CEMS heat rate data and the Joskow-Kahn fuel price assumptions to a centralized day-ahead unit commitment process such as those coordinated by the PJM-ISO and NYISO, Alamos 2 would not have been committed to meet these schedules at these prices because operation of the unit would not have been economic. In the real world, even price-taking competitive suppliers should bid their units into the CAP PX and ISO markets so as to recover their variable operating costs. The Joskow-Kahn simulation model would commit Alamos 2 and other units to operate in circumstances in which it is not efficient for the plant to run and it would be unprofitable for price-taking suppliers to operate in the actual dispatch.

Table 8 Alamitos 2 Profitability June 17, 2000			
	SP-15 PX Prices	Unconstrained PX Prices	SP-15 Real-Time Prices
Actual Heat Rate			
Profitable Hours	22119		3744
All Hours	-1724		-29080
Incremental Heat Rate			
Profitable Hours	40723	47870	19449
All Hours	35537	45573	8180
Calculations do not include variable O&M, emission allowances or station costs.			

Since the Joskow-Kahn simulation results, like those of the BB&W and the MSC, take no account of start-up and minimum load costs, the impact of minimum-load and start-up costs and operating constraints would show up in the Joskow-Kahn study as indistinguishable from anticompetitive withholding.

The impact of these implicit assumptions regarding minimum-load costs and operating constraints is potentially magnified by the increase in emission allowance costs during 2000. If emissions are a function of energy inputs, total daily emissions per MW will be higher than implied by incremental heat rates alone and these costs will be much higher per MW during the hours with poorer heat rate performance. Table 9 illustrates this impact for Alamitos 2 on June 17, using the CEMS emission rate for 1Q 2000 and an assumed NO_x allowance price of \$10/lb. It can be seen that the operation of Alamitos 2 would have been dramatically unprofitable at day-ahead PX prices on this day, losing slightly more than \$33/MWh.⁵⁸ At the same time, a calculation based on incremental heat rates, and assuming that the unit would have operated only during the hours in which it was profitable, would imply profits of \$28/MWh.⁵⁹

⁵⁸ -\$36,382/1081 MWh.

⁵⁹ \$30,574/1081 MWh.

Table 9				
Alamitos 2 Profitability June 17,2000				
With and Without Emissions Allowance Costs				
	All Hours		Profitable Hours	
	No Allowance Costs	Allowance Costs	No Allowance Costs	Allowance Costs
Actual Heat Rate	-1724	-36382	22119	5299
Incremental Heat Rate	45573	25027	47870	30574
Emission rate .189 pounds per mmBtu per CEMS.				
Assumed allowance costs \$10/pound.				
Calculated profitability does not include variable O&M or station costs.				

These calculations for Alamitos 2 are only illustrative and we have not repeated this calculation for every unit for every day of June. The point of these calculations is that the financial impact of minimum load costs and operating inflexibilities is not necessarily insignificant. Simulation models that implicitly or explicitly make unit commitment decisions without regard to these costs have the potential to misstate the competitive level of electricity prices.

A failure to include either start-up and minimum-load costs or operating parameters in simulation models will also hinder the ability of these models to accurately account for the environmental constraints discussed above. In simulations lacking these costs and constraints, environmental constraints would be less limiting because units subject to such limits could be dispatched only in high-priced hours, conserving their hours on-line or operating factor. In the real world, however, some of the units subject to these environmental limits were steam units with start-up times, minimum-load levels and minimum down times. They could not be simply turned on and off hour by hour as needed, and having them available to meet load in high-priced hours could entail running them and using up limited operating time or output in other lower-price hours. These effects would be entirely missing in non-chronological simulation models that do not account for these kinds of constraints.

Simple non-chronological models that do not account for start-up and no-load costs cannot accurately simulate the competitive level of prices. As illustrated above, this is not a detail. It can be a fundamental limitation. A better alternative would be to assume that market participants were able to replicate the results of a centralized unit commitment process through their individual one-part bids and self-commitment and thus to estimate market prices based on the estimated multi-part cost functions of the various generators.⁶⁰ This method of simulating

⁶⁰ Simulation models such as GE MAPS could do this, as well as taking account of transmission constraints.

market prices would still be biased toward finding market power, because it would tend to attribute to market power the inefficiency arising from the California market design,⁶¹ but the estimates would be less biased than those provided by a methodology which simply assumes that start-up and no-load costs and other operating inflexibilities are not material.⁶²

e) Outage Assumptions

Like the BB&W and MSC analyses, the Joskow-Kahn study bases its simulation on assumed outage rates rather than actual outage data for the period studied. The Joskow-Kahn methodology for taking account of forced outages differs, however, from that of BB&W and the MSC. It assumes that all California generators (both fossil and must-take) suffer outages in each period in proportion to the forced outage rate in the Henwood database.⁶³ Like the methodology in the BB&W and MSC studies, this approach will overstate the available generation to the extent that the actual outage rate differed from that in the Henwood database, either due to fortuitous events or due to hard use.⁶⁴ The methodology therefore cannot distinguish between high prices due to the exercise of market power or to higher than assumed outage rates.

Moreover, it would be inappropriate to assume that increased levels of forced outages necessarily reflect the exercise of market power. For example, AES encountered substantially higher outage rates on all of its units during 2000 than in 1998 or 1999,⁶⁵ yet AES had sold its output forward and did not benefit from higher prices.⁶⁶ Indeed, AES lost money in California during 2000.⁶⁷ Similarly, the summer-long outage of PG&E's Hunters Point units 2 and 3 and the outage of Hunters Point 4 during May and June presumably raised prices in the real world relative to the prices simulated by Joskow and Kahn and this effect would be included in the price difference they attribute to market power but, as a substantial net buyer, PG&E presumably had no incentive to withdraw output from the market to raise prices.⁶⁸

⁶¹ See the discussion in Harvey-Hogan, pp. 8-14, 31-34, and item 6 below.

⁶² While it is more difficult to model the electric industry if account is taken of start-up and minimum-load costs, these costs are sufficiently important that the standard industry simulation tools take them into account. GE-MAPS, for example, could be used to simulate unit commitment and prices taking account of start-up and no-load costs. Since MAPS also models the transmission system, this approach would also have enabled simulation of the effect of locational constraints and RMR calls, modeling of reserve requirements, and evaluation of environmental output limits.

⁶³ Joskow-Kahn, p. 14.

⁶⁴ Thermal generators in California operated at higher levels than in previous years throughout the period May through December, so historical outage rates may be not accurate for 2000 operating conditions (see Figure 5 above and Figure 24 below).

⁶⁵ Stu Ryan, AES Pacific, February 1, 2001, Analyst Presentation (hereafter Ryan).

⁶⁶ A further complication, not addressed here, would be the full analysis of the forward contracting position of the thermal generators, which could affect their incentives for strategic withholding.

⁶⁷ AES January 29, 2001, Press Release re annual earnings. Aesc.com/investor/press/index.html

⁶⁸ Joskow and Kahn state that they relied on the commercially available Henwood database for capacities (p. 14) but it is not entirely clear which units were included from the database. In particular, it is not clear whether the capacities of units owned by entities other than the five large non-utility generators (AES, Duke, Dynegy/NRG, Mirant and Reliant) that were not available in June 2000(such as 377 MW of PG&E's Hunters Point steam

In addition, by smoothing the incidence of outages over time, the Joskow-Kahn approach to outage modeling introduces a new problem not found in the BB&W or MSC studies.⁶⁹ The Joskow-Kahn approach of proportionally derating every unit in every hour is easy to implement but has the limitation that to the extent that real-world outages of either fossil generation or must-take generation were lumpy, this methodology would tend to reduce the number of shortage hours by smoothing out the impact of outages.⁷⁰ This limitation of the Joskow-Kahn methodology can be illustrated with a simple example. Suppose that there were two 1,000 MW units in the market with a 5 percent outage probability. The Joskow-Kahn methodology would assume that the units would provide 1,900 MW of capacity with a probability equal to one, while in the real world there would be a 90.25 percent probability of having 2,000 MW of capacity, a 9.5 percent probability of having 1,000 MW of capacity and a .25 percent probability of having no capacity. Obviously, if load exceeds 1,000 MW, shortages would be much less likely if outages occurred in the manner assumed by Joskow and Kahn than they would be in the real world. If real-world units suffered outages in the smooth predictable manner assumed by the Joskow-Kahn model, less available capacity would be needed to meet load, supply would be larger relative to demand and prices would be lower. Such an assumption can obscure the reasons for high prices in California and the distinction between competitive behavior and the exercise of market power, because real-world units do not suffer outages in this nice, smooth predictable manner.

The actual impact of the Joskow-Kahn assumptions regarding outage rates and incidence are difficult to assess without knowing the actual pattern of real-world outages. Data showing atypically high outage rates for AES units in the summer of 2000⁷¹ and knowledge of PG&E's Hunter Point outages, in combination with the information in the FERC Outage Report, however, suggest that understatement of real-world forced outage rates have depressed the simulated competitive prices in the Joskow-Kahn study.

units and the 140 MW of Thermo-Ecotek's Riverside units) were treated as available in the simulation. We have confirmed that the Hunters Point units were treated as available in the simulation, which would tend to cause the simulation to understate the competitive price.

⁶⁹ BB&W and the MSC went to great lengths to avoid this potential source of bias, using actual output data for must-take and geothermal generation and using Monte-Carlo simulation methods to account for the impact of random forced outages of thermal units on prices, see BB&W, pp. 28, 41-43.

⁷⁰ We have confirmed that the unit capacities used by Joskow and Kahn in the simulation analysis were net output capacities (i.e., net of the electricity output consumed by the generating unit).

⁷¹ See Ryan.

f) Inefficiency of California Market Structure

The California electricity markets have a number of design features that predictably cause suppliers entirely lacking market power to bid their resources into the market at the expected market-clearing price rather than at their costs.⁷² In addition, the one-part bidding mechanism requires that market participants make guesses about market-clearing prices in order to determine the offer price of potentially extra-marginal units with start-up or minimum-load costs.⁷³ Even if these guesses do not change the identity of the resources used to meet load, errors in predicting the market-clearing price could raise the prices paid by loads (if generators guess that the market-clearing price will be higher than it actually turns out to be) or could reduce the prices paid by loads (if generators guess that the market-clearing price will be lower than it actually turns out to be). If there were no change in the actual resource cost of meeting load, the errors might cancel out and have no impact on market efficiency or real-world market prices.

In practice, however, it is unlikely in our view that load will be met at least cost in markets that clear based on generators guessing the market-clearing price. Instead, it is likely that some of the generators that overestimate the market-clearing price would be lower cost than some of the generators whose bids clear in the market. In this circumstance, the bidding errors attributable to non-uniform pricing would not cancel out, because the guesses would change the resources used to meet load and the supply curve would in effect be shifted in as a result of some supply resources not clearing in the market despite being infra-marginal on a cost basis.

The inefficiency of the California market might also exacerbate the impact of the annual run time and capacity factor limits by making it more difficult for California generators to bid their units into the market to provide reserves but with sufficiently high energy bids that the units would rarely be dispatched for energy. The lack of cooptimization of the energy and reserve markets, the pay-as-bid structure of the ancillary services market arising from the rational buyer protocol, and the non-least-cost dispatch of reserves and other energy to meet load in real time create a market structure in which energy-limited resources may not be efficiently allocated between reserves and energy. This effect would potentially be exacerbated by the lowering of the price caps in July and August, which would cause many suppliers to offer energy at the price cap, increasing the likelihood that generators trying to ration their hours of operation would be dispatched for energy if they offered their capacity in the market. These kinds of inefficiency in the California market structure have been long recognized, but their costs may have been magnified by the energy shortage created by low hydro conditions and hot weather in the west.

The design of the California market was premised on there being other advantages that compensate for this inefficiency in the short-term market. Even if that is the case, however, the inefficiency of the short-term market must be taken into account in empirical analyses of market performance. While reasonable people may disagree over the magnitude of the short-run inefficiency arising from the non-uniform, pay-as-bid pricing elements of the California market design, simulations of competitive prices intended to identify the exercise of market power must

⁷² These features, as well as evidence of the inefficiency to which they lead, are discussed in Harvey-Hogan, pp. 6-14.

⁷³ See Harvey-Hogan, pp. 14-16, 38-39.

recognize that this inefficiency exists and account for it in the analysis. Like BBW and the MSC, the Joskow-Kahn analysis of supply, in effect, simulates the market-clearing prices that would arise under a centralized market-clearing process for energy and ancillary services, rather than simulating likely competitive outcomes under the actual California market structure.

The quantitative impact of the inefficiency introduced by the California market design is hard to assess. Indeed, it is not apparent that there is any simple, reliable method of assessing the impact of this inefficiency.⁷⁴ It should be apparent, however, that it is not appropriate to simply attribute to the exercise of market power all differences between the price levels that might prevail in centrally coordinated day-ahead and real-time markets⁷⁵ and the price levels prevailing under the California market design.

3. New Problems

While the Joskow-Kahn study improves on some areas of the BB&W and MSC studies, there are also two areas (the method of measuring load and the method of determining hydro output) in which the methodology and data employed in the Joskow-Kahn study could introduce new problems.⁷⁶ The method of measuring load is likely to cause the simulation to understate the competitive price level while the impact of the hydro methodology cannot be determined without access to data on actual hydro output in high-load hours.

a) Monthly Load Aggregation

The Joskow-Kahn simulation analyzes supply and demand for monthly rather than hourly periods, and analyzes load within each month by deciles.⁷⁷ This approach tends to understate the impact of peak load demand on prices and is likely to understate the number of shortage hours.

One source of the bias from this approach is that monthly load is highly variable, and there is considerable variation in loads within the top decile of load hours. Thus, as seen in Figures 10, 11 and 12, the actual loads in the top decile exceeded the average load for the decile in June by 1,000 MW or more in 18 of the 72 hours, in July for 19 of the 74 hours, and in August for 12 of

⁷⁴ One might attempt to develop measures of market inefficiency from data on the frequency of irrational price patterns in PX and CAISO markets that might be compared to similar statistics for PJM and NY. Even with such measures, however, it is doubtful whether there is a reliable criteria for translating indicators or relative market efficiency into price impacts.

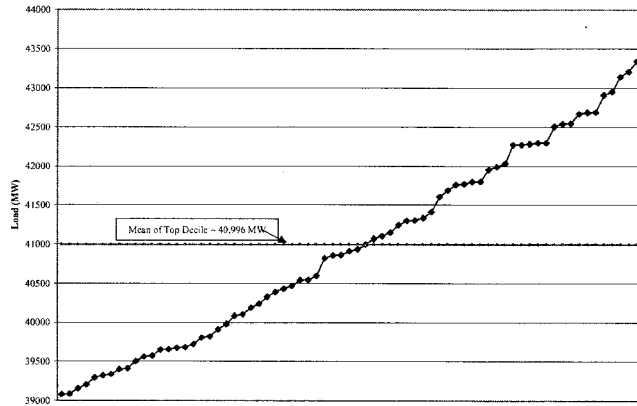
⁷⁵ Such as those coordinated by the PJM ISO and NY ISO.

⁷⁶ An additional methodological issue that is probably not material in June and July, but may be more important in the August through December 2000 period (with increased gas price volatility), is the use of monthly average gas prices rather than daily gas prices. If gas prices are correlated with the amount of gas-fired generation running, and thus with the heat rate of the marginal unit, the use of monthly averages may cause simulation results to understate the competitive level of electricity prices.

⁷⁷ Joskow-Kahn, p. 12. Joskow-Kahn state that they take this approach because they lack access to publicly available hourly data on hydro power production inside California. It is not apparent, however, how averaging loads in this manner reduces the error associated with their procedures for modeling hydro power. It appears, on the contrary, that this procedure serves only to introduce error into the demand measures used in their simulation, in addition to the potentially poor measurement of hydro supply.

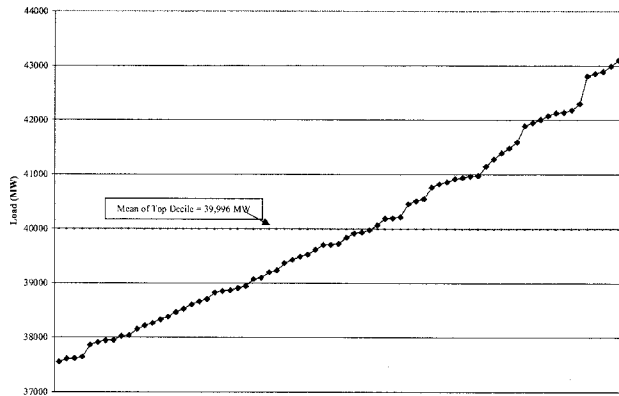
the 74 hours. Using the average decile load rather than actual loads in the Joskow-Kahn simulation therefore materially understates load in many of the high-priced hours. This understating of load in the highest price periods has the potential to materially understate the simulated prices in these hours, especially by eliminating shortage hours.

Figure 10
Top Decile of Actual Load, June 2000



If the relationship between prices and loads were linear (i.e., a 500 MW increase in loads resulted in an X dollar increase in prices at all points along the supply curve), then this averaging of loads would not affect the average prices simulated by the study, as if loads were 500 MW higher than the monthly average in some hours and 500 MW lower than the monthly average in other hours, the prices would also be correspondingly higher and lower and the simulated average monthly price would not be affected by the intra-month variation in loads.

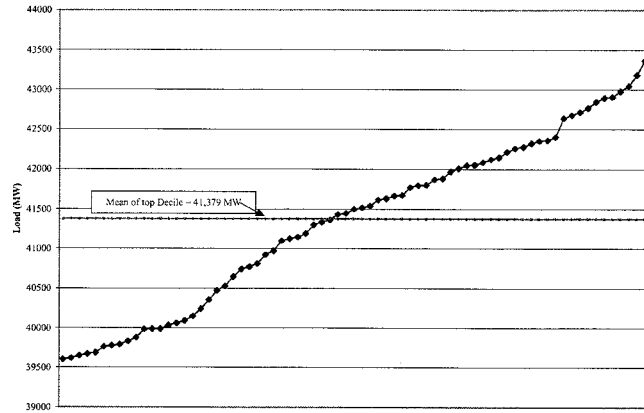
Figure 11
Top Decile of Actual Load, July 2000



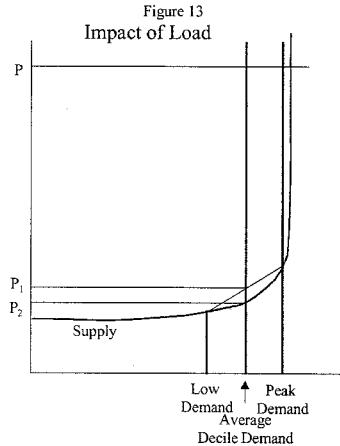
The relationship between loads and prices in a competitive California electricity market should, however, be expected to be non-linear for two reasons.⁷⁸ First, as capacity is exhausted, the running and opportunity costs of the marginal units probably rise much more rapidly than load. Second, the system is much more likely to be in a state of shortage, with prices rising to the price cap in very high load conditions.

⁷⁸ BB&W also assume such a convex relationship, BB&W p. 20.

Figure 12
Top Decile of Actual Load, August 2000



In these circumstances, the load averaging procedure of Joskow and Kahn is likely to reduce the number of hours that the simulated market clears on the very steep portion of the supply curve or that the price rises to the price cap as a result of the market failing to clear in a shortage. Because the actual competitive market price rises more when load is above average within the highest decile than it falls when load is below average in this decile, the use of deciles, rather than hour-by-hour data, to simulate competitive prices tends to bias the simulated price downward, relative to actual average prices, as illustrated in Figure 13. P_1 is the average of the prices when load is low and high, while P_2 is the price corresponding to the average load. If the supply curve is convex, P_1 will lie above P_2 . Joskow and Kahn in effect simulate P_2 .



A related issue is how the Joskow-Kahn study treated shortage hours. There is no discussion in Joskow-Kahn of how prices were determined in hours in which the simulated market failed to clear, a topic that was explicitly discussed in BB&W.⁷⁹ Having accounted for ancillary services demand equal to 10 percent of load, one would expect that the Joskow-Kahn study would have identified many more hours of shortage than did BB&W or the MSC.⁸⁰ The implication of this lack of discussion of shortage hours is that the Joskow-Kahn procedure for estimating peak loads, perhaps in combination with the assumptions regarding hydro power availability discussed below, eliminated shortage hours in the simulation of June prices. If this is the case, it may not be surprising that the Joskow-Kahn simulation would fail to replicate real-world prices since shortage conditions appear to have driven most of the high priced hours during June.⁸¹

b) Hydro and Geothermal Power Allocation

Joskow and Kahn apparently allocate monthly hydro power equal to 60 percent of the historical monthly hourly average supply to each hour in the month, and then allocate the rest to the high-

⁷⁹ BB&W, p. 21.

⁸⁰ The BB&W and MSC analysis of demand did not take account of the capacity required to provide reserves, BB&W, p. 19 and Harvey-Hogan, pp. 30-31.

⁸¹ See Harvey-Hogan, pp. 16 to 25, for a discussion of the relationship between high prices and shortage conditions during June. A California ISO Department of Market Analysis Study, "Report on California Energy Market Issues and Performance: May-June 2000," August 10, 2000, argues that many of the high-priced hours did not reflect shortages (pp. 47-51). This analysis, however, is not based on actual real-world unit availability, but assumes no thermal units were derated, no outages of thermal units occurred during these days, and that any units that came on-line were immediately available at full output.

priced hours, up to 8,000 MW.⁸² This procedure allocates 8,000 MW of hydro power to the top four load decile hours, and 3,155 MW to the lowest five decile hours.⁸³ If the full 8,000 MW of hydro capacity were not actually available in all of the high-priced hours, the Joskow-Kahn methodology would overstate the capacity available in the peak hours in which prices were high, eliminating shortage hours and downward biasing simulated prices in these hours.⁸⁴

Like the load aggregation procedure discussed above, the potential impact of the hydro power allocation rule on the results of the price simulation arises from the non-linear impact on prices of supply reductions when the market is tight. The hydro power allocation rule would not make much difference if the supply curve had a constant slope over its entire length. In this situation, an increase in load of 1,000 MW would have the same impact on price whether it happened on a high-load hour or a low-load hour and, similarly, a change in hydro power supply would have the same impact on price if it happened on a high-load hour or a low-load hour. If, on the other hand, the supply curve becomes increasingly steep at high-load levels and eventually becomes nearly vertical, then these assumptions could cause the simulation to materially understate the competitive level of prices. It cannot be determined whether the Joskow-Kahn hydro power assumption causes their simulation results to overstate or understate the competitive price level without analyzing the actual pattern of hydro power availability, but the impact could be material.⁸⁵

Although not explicitly described in the paper, we have confirmed with the authors that unlike the MSC and BB&W analyses, the Joskow-Kahn study did not impose limits on the energy output of California geothermal units. This is also a potentially significant assumption whose impact cannot be evaluated without comparing the simulated output with the actual output of the geothermal units. It is noteworthy, however, that the California ISO's recent CAISO 2001 Summer Assessment specifically mentioned the impact of declining steam field pressure on the dependable output of geothermal capacity.⁸⁶

While assumptions like these might be appropriate in a demonstration that it is conceivable that there could have been economic withholding, a study based on such assumptions cannot provide an indication that output withholding by thermal generators occurred because it cannot

⁸² The BB&W and MSC studies made use of confidential hour-by-hour data on actual hydro and geothermal output that was not available to Joskow-Kahn.

⁸³ Joskow-Kahn, p. 38.

⁸⁴ The potential for overstated hydro capacity arises not only from the possibility that the 8,000 MW capacity figure might be high for peak availability but also from the possibility that the number of hours per day that this peak capacity was available was more limited than implied by the non-chronological modeling of supply and demand in the Joskow-Kahn model. The actual hydro generation data apparently utilized by BB&W and the MSC would not only better account for total hydro capacity, but would also better account for limitations on hydro power availability both within a day and over a multi-day hot spell.

⁸⁵ Joskow-Kahn maintain that the assumptions are conservative but no basis is provided for this view (Joskow-Kahn, pp. 12-13).

⁸⁶ California ISO, "CAISO 2001 Summer Assessment," March 22, 2001; "declining steam field pressure has affected the power output of geothermal units within the CAISO Control Area, thereby reducing the overall maximum "Dependable generating capability," p. 5. A similar comment is repeated on page 16. The assessment also refers to the "reduced capacity levels of geothermal resources," p. 8

distinguish economic withholding from incorrect assumptions regarding the level of hydro and geothermal output in high-priced hours.

4. Conclusions

While the Joskow-Kahn simulation study improves on the BB&W and MSC studies in its treatment of NOx allowance costs and ancillary services requirements, it confronts many of the same limitations of the earlier studies. Particularly important in this regard are likely to be the Joskow-Kahn study's treatment of environmental restrictions other than NOx allowance costs, hydro power offer prices, start-up and minimum-load costs, and outage assumptions. In addition, the treatment of load, hydro and geothermal power availability and outage probabilities create sources of imprecision not present in the BB&W and MSC studies.

Overall, the simulation results do not provide evidence that the high prices in California have been attributable to economic withholding. While the study shows that California prices have been higher than they might have been in a world without environmental output limitations, start-up and minimum load costs of thermal generation, energy limitations on hydro and geothermal output and with outage and load patterns matching those assumed in the study, the difference cannot be attributed to market power, as it might be attributable to some or all of these other differences between the simulation and actual power markets.

C. Withholding Analysis

1. Overview

A pathbreaking contribution of the Joskow-Kahn analysis is the use of CEMS data to attempt to test whether available thermal generating capacity was withheld from the real-time market during high-priced hours in June 2000. The CEMS data compiled by the EPA portrays the hour-by-hour gross output of the covered thermal units.⁸⁷

Joskow and Kahn study the hours in June for which the PX day-ahead price exceeded \$120 and compare the actual output of the units studied to the estimated capacity of these units. The analysis posits that any difference between actual and potential output can be attributed only to: 1) capacity used to meet ancillary service requirements; 2) capacity out of service due to forced outages; 3) capacity not available due to inter-zonal transmission constraints; and 4) economic or physical withholding. Joskow and Kahn therefore seek to account for the impact of the first three factors, with any unexplained difference between output and capacity being attributed to withholding and other factors.⁸⁸

This gap or difference between the energy output of a unit and the maximum capacity becomes the focus for examining the possibility of strategic withholding. The extra capacity could be

⁸⁷ <http://www.epa.gov/airmarkets/reporting/edr21/edrinst.june00.pdf>,
<http://www.epa.gov/ardpublic/acidrain/ftp/rawhles.html>.

⁸⁸ Joskow-Kahn, p. 23.

used to supply other services, such as reserves, or result from factors that limit the ability of generators to produce their full output. The gap could also reflect intentional withholding of supply in order to influence market prices. Hence, the size of the gap and the likely magnitudes of these various contributing factors become important in determining the strength of the evidence for any particular interpretation.

This gap analysis faces many of the complications described above for the simulation studies. For example, limitations on ramping of generators could contribute to the gap, but the magnitude is difficult to estimate without detailed dispatch data. Here we examine the analysis as best we can with the available data to indicate the sensitivity of the results and the likely order of magnitude of the potential errors of estimation.

Joskow and Kahn find that the difference between the output and capacity of the plants they study is less than the ISO's ancillary service requirements in NP-15 and greater than the ISO's ancillary service requirements in SP-15.⁸⁹ They further attempt to allow for the impact of forced outages by excluding the capacity of units not operating in the hour, day or prior day from the calculation of the output gap. If the output gap is calculated based on the output of units operating in a given hour, they find a mean output gap of 690 MW in NP-15 compared to total ancillary service requirements of 1,510 MW, and a mean output gap of 1,954 MW in SP-15, compared to total ancillary service requirements of 1,672 MW.⁹⁰ For SP-15 they also compare the estimated output gap to ancillary service requirements and find 49 hours in which there is no congestion from SP-15 to NP-15 in which the estimated output gap in SP-15 exceeds the estimated ancillary service requirements by 500 MW or more, using the best of their measures of the impact of forced outages.⁹¹ Joskow and Kahn then repeat their calculation of the output gap for June using the WSCC EHV data, finding a smaller output gap in NP-15 and a larger output gap in SP-15 than in their analysis based on EPA data. They attribute the larger output gap in SP-15 to the inclusion of additional generation capacity.⁹² This analysis does not, however, include any adjustment for the impact of unit outages. Joskow and Kahn then use the EHV data to extend their analysis of the output gap through September, but without any adjustment to available capacity for the impact of unit outages. They again find a large output gap in SP-15, which they caveat by noting that the gap probably includes a fairly large amount of capacity whose operation was not economic under the price cap during August and September, and that there is no allowance for the impact of forced outages.⁹³ Joskow and Kahn conclude that despite these limitations, their analysis reveals unexplained output gaps that are "sufficiently large to suggest that power supplies were withheld in the zone during the June through September period."⁹⁴

⁸⁹ Joskow-Kahn, Table 8, p. 26.

⁹⁰ Joskow-Kahn, pp. 25-30.

⁹¹ Joskow-Kahn, Table 11, p. 30.

⁹² Joskow-Kahn, Table 12, p. 31.

⁹³ Joskow-Kahn, pp. 31-33.

⁹⁴ Joskow-Kahn, p. 33.

The Joskow-Kahn analysis is a thoughtful effort to quantitatively assess a difficult public policy question. Nevertheless, the analysis has a number of acknowledged and unacknowledged data and methodological limitations, most of which tend to overstate the capacity available to meet load in these high-priced hours or to otherwise overstate the output gap. These limitations include: basing the comparison on hours in which day-ahead, rather than real-time prices, were high, omission of partial unit outages or environmental output limitations; incomplete accounting for ancillary service demand; omission of start-up and minimum load costs; assuming equality between peak hourly demand and average hourly demand; inability to account for the impact of the CAISO's dispatch instructions; potentially overstated unit capacities; an assumption that cumulative annual output limitations were not binding; and assuming that market inefficiency had no impact on available supply. In addition, our replication of their work identified a few data problems.

2. Day-Ahead Prices and Real-Time Output

Joskow and Kahn identify the high priced hours in which they study withholding based on the day-ahead unconstrained PX price. In June the threshold they use for a high-priced hour is a day-ahead price of \$120, \$90 in July, \$130 in August and \$110 in September. Importantly, Joskow and Kahn select the hours they analyze based on high day-ahead PX prices, but then test for withholding based on real-time output. This tends to bias the study towards finding evidence of withholding, even if none existed because the real-time output of a competitive firm depends on real-time prices, not just day-ahead prices. Even if output is sold forward at day-ahead prices, this is only a financial commitment. The ultimate opportunity cost for real-time production is the real-time price that would apply to any differences between day-ahead schedules and actual production.

In particular, the selection of high-priced hours restricts attention to the supply region where Joskow and Kahn presume that competitively offered plants would all be at their maximum output. Higher real-time prices should not produce higher output, but lower real-time prices could result in lower output. The effects do not average out. Therefore, with any significant volatility in real-time prices relative to day-ahead prices, this asymmetry would tend to overstate the implied withholding of supply.

The day-ahead prices used in the Joskow-Kahn study were determined in the PX and reflected day-ahead supply and demand conditions. The day-ahead prices are related to real-time prices because day-ahead demand and supply offers will be affected by expected real-time demand, supply and prices. Nevertheless, it needs to be recognized in empirical analysis that actual real-time prices will often differ from expected real-time prices. In particular, day-ahead prices are sometimes high in expectation of high loads that fail to materialize in real time. When this occurs and real-time load is lower than anticipated, real-time utilization and prices will also be reduced.

Examples of such unfulfilled expectations can be seen on June 16, 23 and 30 in the DMA report on May-June 2000, and for a number of hours on June 15.⁹⁵ Because the Joskow-Kahn methodology is based on day-ahead prices and real-time output, it treats output reductions associated with real-time load and price declines as anticompetitive withholding, when it could reflect an efficient and competitive response to lower demand and prices.

In order to assess the impact of the Joskow-Kahn study's reliance on day-ahead, rather than real-time prices, the Joskow-Kahn withholding analysis has been replicated for the companies and units whose output was analyzed by Joskow and Kahn. First, Joskow and Kahn's finding that the output gap for these units averaged 983 MW in the North and 3,351 MW in the South in the 137 June hours in which the PX day-ahead price was \$120/MWh or more was largely replicated. The results of this replication are portrayed in Table 14. One difference that should be noted as it will affect some of the discussion that follows is that the generators labeled by Joskow and Kahn as NP-15 generators are actually located in three zones: NP-15, Z-26 and SF, as noted on Table 14. This difference is important later, as their analysis of ancillary service supply did not include the CAISO data for the SF and Z-26 zones, although their calculation of an output gap included generators in these zones. In order to maintain consistency with the Joskow-Kahn calculations and facilitate comparisons, Z-26 is treated below as if it is part of NP-15, which is not accurate.

⁹⁵ California ISO, Department of Market Analysis, "Report on California Energy Market Issues and Performance: May-June 2000," August 10, 2000, p. 13.

Table 14						
Output Gap (MW), Not Adjusted for Outages						
June 2000, PX Price > \$120/MWh						
Owner	Joskow-Kahn Calculation			Replication		
	Maximum Output (A)	Mean Output (B)	Output Gap (C)	Maximum Output (D)	Mean Output (E)	Output Gap (F)
NP-15, SF and Z-26						
Duke	2,563	2,422	141	2,563	2,422	141
Southern	2,932	2,090	842	2,932	2,090	842
Total	5,495	4,512	983	5,495	4,512	983
SF and Humboldt						
PG&E	NA	NA	NA	279	93	186
SP-15 (excluding Z-26)						
AES	3,681	2,542	1,139	3,681	2,542	1,139
Duke	733	643	90	733	643	90
Dynegy	2,000	1,014	986	2,000	1,014	986
Reliant	3,487	2,351	1,136	3,487	2,351	1,136
Total	9,901	6,550	3,351	9,901	6,550	3,351
Source:						
(A) – (C): Joskow-Kahn, Table 8						
(D) – (E): CEMS Data						
(F): Col. (D) – Col. (E)						

Table 14 also differs from the figures reported by Joskow and Kahn in that it includes a similarly calculated output gap for PG&E, which continued to own two plants in the north during the study period. It can be seen that using the Joskow-Kahn methodology there is a large implied output gap for the PG&E plants as well as for the plants of the new generators.

Having largely replicated the Joskow and Kahn analysis with day-ahead prices, the approach can be applied with real-time price data. The real-time zonal uninstructed energy prices for NP-15 and SP-15⁹⁶ were then examined for these same 137 hours, and it was found that they exceeded \$120/MWh in only 86 hours in NP-15 and 85 hours in SP-15. Table 15 portrays the result of repeating the Joskow-Kahn output gap calculation for these high-priced real-time hours. It is seen that the average output of both the new generators and PG&E was generally higher in the hours in which the average hourly real-time price was also high. This would be expected in a competitive industry as lower real-time prices should be expected to cause competitive firms to

⁹⁶ See caiso.com/marketops/Oasis/pubmkt2.html. Ex Post Market Information (button 29).

reduce output. When the output gap is calculated for these high-priced real-time hours, the gap falls by 204 MW in the north and 251 MW in the south, relative to that calculated by Joskow and Kahn.

Table 15					
Output Gap (MW), Not Adjusted for Outages					
June 2000					
Owner	Maximum Output (A)	PX Price > \$120/MWh		PX and Real-Time Price > \$120/MWh	
		Mean Output (B)	Output Gap (C)	Mean Output (D)	Output Gap (E)
NP-15, SF and Z-26					
Duke	2,563	2,422	141	2,416	147
Southern	2,932	2,090	842	2,300	632
Total	5,495	4,512	983	4,716	779
SF and Humboldt					
PG&E	279	93	186	100	179
SP-15					
AES	3,681	2,542	1,139	2,589	1,092
Duke	733	643	90	663	70
Dynegy	2,000	1,014	986	1,125	875
Reliant	3,487	2,351	1,136	2,424	1,063
Total	9,901	6,550	3,351	6,801	3,100
Source:					
(A) - (C): Joskow-Kahn, Table 8 and CEMS Replication Table 14, above					
(D): CEMS					
(E): Col. (A) – Col. (D)					

It is possible to use these data to test whether the calculated output gap in the hours in which both the PX and real-time prices exceeded \$120/MWh is statistically different from the calculated output gap in the hours in which the PX price exceeded \$120/MWh in both NP-15 and SP-15 but the real-time price did not. For the purpose of this test we have dropped the hour included in the Joskow-Kahn analysis in which the hypothetical unconstrained PX price exceeded \$120/MWh but the actual SP-15 PX price was less than \$120/MWh.⁹⁷ For the combined North and South regions the mean output gap was 5,089 MW in the hours in which the real-time price was less than \$120/MWh and 3,862 MW in hours in which the real-time price

⁹⁷ This is the reason that the mean for NP-15 used in the test differs slightly from the mean in Table 15.

exceeded \$120/MWh. The difference is 1,217 MW which is statistically significantly different from zero at above the 99.9 percent confidence level (the t-statistic is 5.70).

For the South alone the difference in means is 662 MW (3,762 to 3,100 MW), which is also statistically significantly different from zero at more than the 99.9 percent confidence level (the t-statistic is 4.37). Finally, for the North alone the difference in means is 555 MW (1,326 to 771 MW), which is statistically significantly different from zero at above the 99.9 percent confidence level (the t-statistic is 6.93).

Joskow and Kahn recognize that their initial comparison of output to estimated maximum unit capacity (Table 8) makes no allowance for capacity not available due to outages. To account for the effect of unit outages on available capacity they develop three alternative measures of available unit capacity: capacity of units on-line in the hour; capacity of units on-line at some time during the day; and capacity of units on-line at some time during that day or at some time during the prior day.⁹⁸ While these measures adjust available capacity in the right direction, all are imperfect measures of the amount of capacity not available due to outages, deratings or environmental output restrictions and could materially overstate the available capacity in the California market. Tests 2 and 3 have the limitation that they include the capacity of units that were not actually on-line during the hour and therefore could not generate energy. While such a lack of availability could reflect a unit being physically withheld from the market, it also could reflect a unit that has suffered an outage since the start of the day or the prior day.⁹⁹ Moreover, it is evident from the FERC staff discussion of forced and maintenance outages at Reliant and NRG plants that these outages had an important effect on generation availability.¹⁰⁰

Test 1 excludes from the calculation of the output gap, the capacity of units that were not on-line at the time. This approach avoids including in the calculated output gap the capacity of units that were unavailable due to forced outages. In replicating their calculation of the output gap thus adjusted for outages (Test 1), it became apparent that there were one or more typographical errors in the figures Joskow and Kahn report for Southern Energy/Mirant. Table 8 in Joskow-Kahn reports a mean output of 2,090 for Southern and Table 10 reports a capacity of 2,395 MW, which would imply an output gap of 305 MW rather than the 571 MW reported in Table 10. Our application of the Joskow-Kahn methodology to calculating capacity for Southern Energy yielded a figure of 2,740 MW, however, rather than 2,395 MW for capacity, implying an output gap by their standard of 650 MW.¹⁰¹ The other capacity figures and output gaps in Joskow-Kahn Table 10 were replicated, as shown in Table 16.

⁹⁸ Joskow-Kahn, pp. 27-29.

⁹⁹ As discussed below in item 6, the lack of availability could also reflect a unit whose start-up costs made it uneconomic for the unit to start in order to meet a short term load and price spike.

¹⁰⁰ FERC Outage Report, pp. 9, 17-19, 22-23, 27, 41-43, 48-50.

¹⁰¹ We have confirmed that the 571 MW figure is a typographical error and that 650 MW is the correct figure.

Table 16						
Output Gap (MW), Adjusted for Outages (Test 1)						
June 2000, PX Price > \$120/MWh						
Owner	Joskow-Kahn Calculation			Replication		
	Maximum Output (A)	Mean Output (B)	Output Gap (C)	Maximum Output (D)	Mean Output (E)	Output Gap (F)
NP-15, SF and Z-26						
Duke	2,541	2,422	119	2,541	2,422	119
Southern	2,395	2,090	571*	2,740	2,090	650
Total	4,936	4,512	690	5,281	4,512	769
SF and Humboldt						
PG&E	NA	NA	NA	109	93	16
SP-15						
AES	2,945	2,542	403	2,945	2,542	403
Duke	723	643	80	723	643	80
Dynegy	1,611	1,014	597	1,611	1,014	597
Reliant	3,225	2,351	874	3,225	2,351	874
Total	8,504	6,550	1,954	8,504	6,550	1,954
* Columns (A), (B) and (C) for Southern do not add due to typographical errors in original.						
Sources:						
(A), (C): Joskow-Kahn, Table 10						
(B): Joskow-Kahn, Table 8						
(D), (E): CEMS Replication						
(F) (D) – Col. (E)						

This calculation of an outage adjusted output gap was then repeated for the 86 hours in the north and 85 hours in the South in which both the PX and real-time prices exceeded \$120/MWh. For these hours, the Joskow-Kahn methodology yielded an estimated output gap by their standard of 598 MW in the north and 1,696 MW in the south. This calculation of the real-time output gap is reported in Table 17. The overall output gap of 4,334 MW in Table 8 of Joskow-Kahn thus falls to 2,294 MW if the capacity of off-line units is excluded (to account for outages) and the analysis restricted to hours in which the real-time price exceeded \$120/MWh.

Table 17 Output Gap (MW), Adjusted for Outages (Test 1) June 2000						
Owner	PX Price > \$120/MWh			PX and Real-Time Price > \$120/MWh		
	Maximum Output (A)	Mean Output (B)	Output Gap (C)	Maximum Output (D)	Mean Output (E)	Output Gap (F)
NP-15, SF and Z-26						
Duke	2,541	2,422	119	2,528	2,416	112
Southern	2,740	2,090	650	2,786	2,300	486
Total	5,281	4,512	769	5,314	4,716	598
SF and Humboldt						
PG&E	109	93	16	109	100	9
SP-15						
AES	2,945	2,542	403	2,940	2,589	351
Duke	723	643	80	719	663	56
Dynegy	1,611	1,014	597	1,596	1,125	471
Reliant	3,225	2,351	874	3,242	2,424	818
Total	8,504	6,550	1,954	8,497	6,801	1,696
Sources:						
(A) - (C): CEMS Replication Table 16, above, and Joskow-Kahn, Tables 8 and 10						
(D) - (E): CEMS Replication						
(F): (D) - (E)						

It is again possible to use these data to test whether the calculated outage adjusted output gap in the hours in which both the PX and real-time prices exceeded \$120/MWh is statistically different from the calculated outage adjusted output gap in the hours in which the PX price exceeded \$120/MWh in both NP-15 and SP-15 but the real-time price did not. For the purpose of this test we have again dropped the hour included in the Joskow-Kahn analysis in which the hypothetical unconstrained PX price exceeded \$120/MWh but the actual SP-15 PX price was less than \$120/MWh.¹⁰² For the combined North and South regions the mean outage adjusted output gap was 3,428 MW in the hours in which the real-time price was less than \$120/MWh and 2,296 MW in hours in which the real-time price exceeded \$120/MWh. The difference is 1,132 MW which is statistically significantly different from zero at above the 99.9 percent confidence level (the t-statistic is 5.49).

¹⁰² This is the reason that the mean for NP-15 used in the test differs slightly from the mean in Table 17.

For the South alone the difference in means is 676 MW (2,370 to 1,695 MW),¹⁰³ which is also statistically significantly different from zero at more than the 99.9 percent confidence level (the t-statistic is 4.41). Finally, for the North alone the difference in means is 456 MW (1,056 to 601 MW), which is statistically significantly different from zero at above the 99.9 percent confidence level (the t-statistic is 5.77).

3. Outages, Output Restrictions and Deratings

Even the narrowest measure of available capacity employed by Joskow and Kahn (Test 1, which is based on units on-line during the hour) has the potential to overstate available capacity. There are two main reasons for this. First, an important implicit assumption of the Joskow-Kahn withholding analysis is that the impact of forced outages is such that capacity of generating units is either not available at all or available in its entirety. In practice, however, a unit may suffer equipment failures that reduce the unit's capacity, without requiring that the unit be taken off-line.¹⁰⁴ Indeed, it is particularly likely during high-priced hours that competitive unit owners would endeavor to keep units with operating problems on-line but operating at reduced capacity. Moreover, units that have suffered outages and attempt to come back on-line would be treated under Test 1 as fully available during the hour in which they came on-line. This would be true even if the units failed to come back on-line and generated power only for a short period of time.

Second, as discussed above, some units are subject to environmental restrictions that may preclude them from operating at full capacity.

The Joskow-Kahn methodology, however, makes no allowance for environmental restrictions that reduced unit capacity at times during the summer. As discussed in Section IV.B above, these kinds of environmental limits may have affected the capacity of at least Duke's South Bay unit and Mirant's Pittsburgh and Contra Costa units.

In most cases the capacity subject to these environmental restrictions would be available for use in emergency conditions, but not all of the hours analyzed by Joskow and Kahn were emergency conditions. This is particularly true during July and August when rising gas and allowance costs lifted the incremental costs of many units above the price thresholds used to identify high priced hours in the Joskow-Kahn analysis.¹⁰⁵

It is not known how to assess the impact of deratings and other output limitations on the output gap calculated by Joskow and Kahn using the CEMS data. While a variety of procedures might be used to try to draw inferences regarding such deratings from the CEMS data, it seems to us that these procedures all have the potential to confuse withholding with deratings and vice versa. The reality is that there is no point in devoting a lot of resources to making guesses about the level of deratings and other output limitations in the hours analyzed by Joskow and Kahn, as the

¹⁰³ The 1,695 MW differs slightly from the number in the table due to rounding.

¹⁰⁴ A number of apparent examples of such partial outages or deratings are found in the recent FERC Report on California outages, FERC Outage Report, pp. 8-9, 27-28, 43, 49.

¹⁰⁵ To the extent that units face incremental costs above the thresholds, they should be removed from the analysis of withholding.

actual data regarding the level of capacity offered to the market by each unit is readily available to the CAISO and thus presumably to FERC.

4. Understated Ancillary Service Requirements.

Joskow and Kahn attempt to account for the CAISO's ancillary service requirements in their assessment of whether economic withholding occurred by accounting for the amount of capacity in SP-15 and NP-15, separately, required for ancillary services. Their approach is to compare their estimate of the total output gap to the total ancillary service "requirements" or "demands" for the zone and to infer the existence of possible withholding if the output gap exceeds the ancillary service "requirement." As they note, such an approach would be conservative because it would implicitly assume that all ancillary services were provided by California thermal units, when in practice some portion of the ancillary services were likely provided by external units, internal hydro or geothermal resources or quick-start units not included in the CEMS data.¹⁰⁶

Although Joskow and Kahn do not precisely identify the data they utilize to measure ancillary service "demand," their figures can be nearly exactly reproduced by averaging the CAISO published data for hour-ahead ancillary service procurement from generators for NP-15 (excluding SF and Humboldt) and SP-15 (excluding Z-26),¹⁰⁷ as shown in Table 18. It appears from this replication that the Joskow-Kahn methodology is not quite as conservative as their description suggests. First, the data they apparently utilize is for ancillary services procured from generation located within the zone, rather than total demand for ancillary services, and therefore does not include ancillary services scheduled to be provided by load or imports. Second, the figures cited by Joskow and Kahn for ancillary services demand in NP-15 and SP-15 do not include ancillary services procured in the SF or Z-26 zones, but their calculation of the output gap includes thermal generation located in SF and Z-26. Inclusion of the ancillary services procured from generation located in SF and Z-26 increases the ancillary services procurement calculated by Joskow and Kahn by somewhat more than 100 MW, as shown in Table 18.

¹⁰⁶ See Joskow-Kahn, p. 26.

¹⁰⁷ See www.caiso.com/marketops/oasis/pubmkt2.html. Hour-ahead ancillary procurement (button 20).

	NP-15		North ¹	SP-15 (excluding Z-26)		Humboldt (F)
	Joskow- Kahn (A)	Replication (B)		Joskow- Kahn (D)	Replication (E)	
Regulation	--	407	413	--	519	0
Spin	--	471	496	--	142	13
Non-Spin	--	181	198	--	387	1
Total, excluding replacement	--	1,058	1,107	1,044	1,048	15
Replacement	--	448	502	628	629	2
Total	1,510	1,506	1,610	1,672	1,678	16
Unadjusted Output Gap	983	983	983	3,351	3,351	16

¹ North includes NP-15, SF and Z-26.

Sources:
(A), (D): Joskow-Kahn, Tables 8 and 13
(B), (C), (E) and (F): www.caiso.com/marketops/OASIS/pubmkt2.html

As discussed above, it is also desirable to revise this calculation to exclude the hours in which day-ahead prices were high, but real-time prices were not high and thus generation was dispatched down in real-time. This information is portrayed in Table 19. Perhaps because these hours were somewhat higher load than the hours in which real-time prices were lower, the procurement of ancillary services other than replacement reserves from generators averaged slightly higher in these hours than in the hours analyzed by Joskow and Kahn (2,224 MW versus 2,155 MW). More materially, the CAISO acquired far more replacement reserves on average during these hours than in the 137 hours analyzed by Joskow and Kahn, so that the total ancillary services procurement for generation corresponding to the generation assets included in calculating the output gap was 3,690 MW in the high real-time price hours compared to 3,288 MW in the high priced PX hours (1,610 + 1,678) and the 3,182 MW figure originally calculated by Joskow and Kahn (1,510 + 1,672).¹⁰⁸

¹⁰⁸ Joskow-Kahn, Table 8, p. 26.

Table 19			
Ancillary Service Procurement (MW) from Generation			
by Zone and Region			
June 2000, PX and Real-Time Price > \$120/MWh			
	North¹	SP 15	
	(A)	(B)	Total
Regulation	433	535	968
Spin	491	153	645
Non-Spin	201	411	612
Total, excluding replacement	1,125	1,100	2,224
Replacement	621	845	1,466
Total	1,746	1,945	3,690
Output Gap			
No Outage Adjustment	779	3,100	3,879
Adjusted for Outages	598	1,696	2,294

¹ North includes NP-15, SF and Z-26.
Source: www.caiso.com/marketops/OASIS/pubmkt2.html

As Joskow and Kahn note, since replacement reserves were acquired by the CAISO in part to meet load, rather than to provide 10-minute reserves or regulation, replacement reserve procurement does not necessarily give rise to a real-time “output gap.”¹⁰⁹ If all of the capacity providing replacement reserves were used to meet real-time load, there would be no output gap in the CEMS data attributable to the replacement reserve capacity. There are, however, several complications in comparing the calculated output gap to ancillary service procurement from generation, excluding replacement reserves.

First, it needs to be recognized that the CAISO procured a substantial proportion of its 10-minute non-spinning reserves from load (133 MW in the north, 287 MW in the south, 420 MW total), or from imports in these high real-time priced hours (see Table 20).¹¹⁰ We have not been able to identify publicly available information that indicates whether operationally the CAISO interrupted the loads providing non-spinning reserves before dispatching replacement reserves (and thus used the replacement reserves to replace the loads as 10-minute reserves) or after dispatching replacement reserves (and thus dispatched the replacement reserves to meet load and kept the load reserves in the form of reserves). Similarly, it is not known whether the CAISO dispatched imports providing 10-minute reserves before dispatching replacement reserves (and thus used the replacement reserves to replace the imports as 10-minute reserves) or after

¹⁰⁹ Joskow-Kahn, p. 26.

¹¹⁰ Imports of spin and non-spin average 394 MW in the 86 hours in which both PX and real-time prices exceeded \$120/MWh.

dispatching replacement reserves (and thus dispatched the replacement reserves to meet load and kept the import capacity in the form of reserves).

Furthermore, it is not known whether the CAISO sought to maintain the location of its non-replacement reserves in real time or allowed the location of these reserves to shift as it met load, so that the average real-time geographic distribution of reserves might differ from the geographic distribution in the hour-ahead schedules.¹¹¹ It can be seen in Table 20 that the total procurement of ancillary services, excluding replacement reserves, is considerably in excess of the procurement from generation. Without knowing how the CAISO used these ancillary service resources in real time it is not possible to determine how much of the capacity included in the calculated real-time output gap for the various subregions was in fact providing ancillary services in real time.

¹¹¹ Joskow-Kahn consider the impact of transmission congestion on their estimated output gap; however, they only consider the impact of congestion on inter-zonal dispatch of energy. They observe that there was no South to North congestion during most of the hours in which they identify an output gap and apparently draw the conclusion that the dispatch of energy to meet load was not impacted by these constraints (pp. 30-31). These data, however, are also consistent with the possibility that the CAISO met NP-15 load with NP-15 generation, including generation procured as reserves, and carried more of its real-time reserves in SP-15. Thus, part of the reason that the real-time output gap in the north is so much less than ancillary service procurement may be that in real-time during some of these high-priced hours the CAISO disproportionately used its reserves in the north to meet load, resulting in more of its real-time reserves being carried in the south.

Table 20 Ancillary Service Procurement and Requirements (MW) June 2000, PX and Real-Time Price > \$120/MWh						
	Ancillary Service Procurement from Generation					Total Ancillary Service Requirements (F)
	North (A)	SP-15 (B)	Imports (C)	Total (D)	Humboldt (E)	
Regulation	433	535	0	968	0	634
Spin	491	153	279	923	9	1,080
Total Non-Spin	334	698	115	1,147	2	1,115
Gen Non-Spin	201	411	115	728	2	
Load Non-Spin	133	287	0	420	0	
Total, excluding replacement	1,258	1,387	394	3,038	10	2,829
Output Gap						
Not Outage Adjusted	779	3,100		3,879		
Outage Adjusted	598	1,696		2,294		

Source: Output Gap, Tables 15 and 17.
Ancillary service data: www.caiso.com/marketops/OASIS/pubmkt2.html
North includes NP-15, SF and Z-26.

Overall, the CAISO was maintaining 3,000 MW of regulation room and 10-minute reserves somewhere on the system during the 86 high-priced hours but the data utilized by Joskow and Kahn are not sufficient to resolve the location at which these reserves were carried in real time, particularly in hours in which large amounts of replacement reserves were also available for dispatch. Moreover, since the CAISO apparently does not publish real-time load by zone, it has not been possible to compare the average level of replacement reserves by zone with the amount of load met with reserves in real time in each zone.¹¹²

Second, the amount of capacity procured as replacement reserves does not necessarily correspond to the amount of capacity needed to meet real-time load. The reported figure for procurement of replacement reserves will understate the amount of reserves potentially used to meet real-time load to the extent that the CAISO purchased capacity to meet its replacement reserve target as regulation, spinning reserves or 10-minute reserves under the rational buyer

¹¹² Even if such zonal load data were available, it would probably be necessary to analyze the data hour by hour to draw any inferences as to whether real-time load could have been met solely with replacement reserves located in that zone.

protocol. This consideration would cause replacement reserve procurement to understate the amount of reserves actually used to meet load in real time and thus overstate the amount of any output gap that is attributable to ancillary service requirements. An alternative approach to measuring ancillary service requirements that would address this potential overstatement would be to compare the calculated output gap to the total ancillary service requirement (excluding replacement reserves), rather than procurement, as shown in Column F of Table 20. A comparison of Columns (F) and (D) suggest that the figure for ancillary services excluding replacement reserves calculated from hour-ahead ancillary service procurement likely includes, on average, around 200 MW of replacement reserves bought as regulation, spin or non-spin.

In addition, the quantity of reserves procured by the California ISO during June was not always sufficient to meet load and maintain the minimum level of operating reserves.¹¹³ The amount of capacity actually providing reserves in real time would therefore have been less than the requirement identified in Table 20 during these shortage hours, so a comparison of ancillary requirements to the output gap could still overstate the amount of capacity providing ancillary services in real time.

The final reason that the amount of capacity procured as replacement reserves may not correspond to the amount of capacity needed to meet real-time load is that neither data on ancillary service procurements nor requirements informs us as to whether the California ISO's replacement reserve requirement, or target, was on average above or below the amount of additional capacity that would be required to meet load and reserve targets. To the extent that the CAISO systematically over or underestimated load, sought to provide a capacity cushion in excess of expected load,¹¹⁴ or sought to be very conservative in scheduling replacement reserves, the replacement reserve target would differ from the amount of reserve capacity that was on average used to meet real-time load.

The third complication in comparing the calculated output gap to ancillary service requirements and procurement is that it needs to be kept in mind that an unknown amount of reserves and regulation would have been provided during these hours by units not included in the Joskow-Kahn analysis, including hydro units, geothermal units, and small units not included in the CEMS database. To the extent that these other sources were actually used to meet ancillary services requirements, more of the calculated output gap could reflect withholding or other factors.

Given these considerations, the output gap methodology has a relatively large margin of error in assessing the amount of capacity actually used in real time to provide ancillary services on the units analyzed. While the CAISO dispatch data should reveal which undispached capacity was providing reserves in real time, there is a rather large margin of error in the Joskow-Kahn approach, ranging from thousands of megawatts of ancillary services that might have been

¹¹³ Data on reserve shortages do not appear to be publicly available. It is possible to infer from a variety of data that is publicly available that California was short of reserves during many hours in June 2000 (see Harvey-Hogan, pp. 22-25).

¹¹⁴ In general, the CAISO operating procedures provide that the CAISO will procure 300-700 MW of replacement reserves (in excess of those required to meet load) (see ISO Operating Procedure M-402, July 14, 2000).

provided by off-line thermal units, or other units not included in their analysis (including hydro and geothermal units) to thousands of megawatts of additional ancillary services that might have been provided by the thermal units they analyze, replacing imports or load in providing spinning and non-spinning reserves. It is evident from Tables 17 and 20 that the output gap, adjusted for unit outages, is substantially less than the total reserves including replacement reserves procured from internal generation and substantially less than total ancillary service requirements excluding replacement reserves. The entire output gap could therefore be accounted for by ancillary service requirements (deratings, overstated capacity and the other factors discussed below). Conversely, these data also do not allow one to rule out the possibility that much of the real-time ancillary service requirements were being carried on units not included in the CEMS data and the output gap, in part, reflects economic withholding. Hence, the data could be consistent with either a fully competitive market with no withholding or with a market in which withholding raised prices. Without access to the dispatch data, the margin of error looks to be larger than the effect to be measured.

5. Uneconomic Energy

The Joskow-Kahn analysis does not differentiate between capacity that is economically or physically withheld in order to exercise market power and that which is economically withheld because the market price is less than the unit's incremental costs. Joskow and Kahn argue that all of the units analyzed in the CEMS data had incremental costs in June that were less than \$120/MWh, but acknowledge that this was not the case for the units included in their analysis for subsequent months, particularly August and September.¹¹⁵ Although Joskow and Kahn assert that this limitation does not apply to their results for July,¹¹⁶ given the low threshold used to define a high priced day in July (\$90), it appears likely that many units would have had incremental gas and allowance costs above the threshold. Indeed, one of the peculiarities of the withholding analysis is that lower price thresholds are used in the analysis for the months of July and September, even though gas and NOx allowance costs are both known to be higher than in June.

Even the \$120 figure for June needs to be interpreted cautiously. First, it is not clear that the time path of RTC prices can be traced with as much precision as Joskow and Kahn suggest. Most of the transactions are recorded during the two-month settlement period following the end of the cycle. Not only are there relatively few transactions recorded during June, but the link between the record date and the price negotiation date is murky. While it may be reasonable to conclude that arm's-length RTC prices during June were in the range of \$5 to \$20 per pound, it is not clear that it can be concluded that the RTC price used in formulating bids during the latter part of June was no higher than \$10. Second, Joskow and Kahn base their evaluation of fuel costs on a posited marginal heat rate of 12,000 Btu/kWh. It is possible that this conjecture is correct for marginal heat rates, but the CEMS data indicates that it is far from accurate for average heat rates for many of these units. The marginal heat rate is relevant to assessing whether it would be economic to fully dispatch a unit given that it is on-line, but the economics

¹¹⁵ Joskow-Kahn, pp. 25, 32-33.

¹¹⁶ Joskow-Kahn, p. 33.

of committing a unit to operate depend on the unit's average or full load heat rate (and the start-up or minimum-load costs incurred in order to have the unit on-line discussed below). It appears that several units included in the Joskow-Kahn withholding analysis, including Redondo 5 and 6, Alamitos 1 and 2, and Alta 3.1 and 3.2 may have had generating costs, including emission allowances but excluding variable O&M, in the range of \$120 to \$150/MWh. Some of these units may therefore have been off-line during some of the hours analyzed by Joskow and Kahn simply because they were not economic to operate at the expected day-ahead prices for those hours.

Another factor that is not taken into account in the Joskow-Kahn withholding analysis is the increasing impact of environmental restrictions as the summer progressed. The reality is that a number of the units included in the Joskow-Kahn withholding analysis reached environmental operating limits before the end of the year. These units were not engaged in anticompetitive withholding; on the contrary, we know with the benefit of hindsight that they failed to engage in enough economic withholding to stay within their operating limits. These plants should have been bid in at higher prices than was actually the case during the first part of 2000. No allowance is directly made in the Joskow-Kahn analysis for the underpricing of this capacity.

This kind of economically efficient output allocation would be treated the same as market power withholding under the Joskow-Kahn Test 1 approach to analyzing withholding in June 2000, as the units would be counted as withholding if they were on-line but not operating at capacity and the Joskow-Kahn analysis includes no other allowance for the impact of annual capacity factor restrictions.¹¹⁷ The owners of the units that ultimately reached environmental operating limits would have at some point during the summer begun factoring these environmental restrictions into their scheduling decisions, operating the units only during the highest-priced hours, with large margins.¹¹⁸ Since the Joskow-Kahn analysis of July-September includes many relatively low-priced hours with low margins, units subject to annual operating restrictions would be expected in a competitive market to be off-line or operating at reduced capacity factors in these hours to conserve their hours of operation for hours of extreme capacity shortage.

6. Start-up and Minimum-Load Costs

Unlike electricity markets in PJM and New York, the California day-ahead markets for energy (PX) and ancillary services (ISO) were based on one-part bids evaluated on an hour-by-hour basis. A day-head PX price of \$120 might cover the variable cost of incremental output, yet it might be uneconomic for the unit owner to start that unit or keep it on-line overnight in order to

¹¹⁷ The data source used for analysis of the July-September period includes more units subject to very strict run time limits. Indeed, some of these units had fewer hours of allowed operation per year than the number of high-priced June hours analyzed by Joskow and Kahn.

¹¹⁸ It is unclear from publicly available data when market participants began to recognize the potential to exhaust their NOx allowances. While AES did not mention the potential to exhaust its NOx allowances in its second quarter report, its third quarter report disclosed this possibility. The AES Corporation, Form 10Q for the period ending September 30, 2000, p. 13. Understanding of AES unit constraints is also complicated by the terms of the forward sale of the capacity to Williams.

sell energy at a price of \$120, particularly if the price exceeded \$120 for a relatively small number of hours.

Since all of the units included in the CEMS data are steam units with start-up and minimum-load costs, it is incorrect to infer that a competitive firm would always be willing to offer supply from these units at a day-ahead price of \$120/MWh, even if \$120/MWh accurately reflected the incremental running cost of the unit. As discussed previously in Harvey-Hogan,¹¹⁹ the day-ahead one-part offer price of a unit lacking market power but having start-up and no-load costs depends in a complex way on expected prices during that hour and other hours of the day. One approach to accounting for start-up and no-load costs would be to use daily strip prices to determine whether a unit would have been economic to operate for the day as a whole,¹²⁰ and then analyze real-time output hour by hour for the hours with high real-time prices.

An alternative approach to controlling for start-up and no-load costs would be to restrict the analysis to the output decisions of units that were actually on-line in real-time. Start-up and no-load costs are irrelevant for units that are actually operating, as those costs are sunk in real time. This approach to accounting for start-up and no-load costs corresponds to the Joskow-Kahn Test 1 for measuring available capacity, as this test would only include the capacity of units on-line during the hour. Part of the large difference between the unadjusted output gap Joskow and Kahn calculate and the output gap calculated using Test 1 is, therefore, potentially due to the impact of start-up and no-load costs and high average operating costs, as well as outages. This needs to be kept in mind in evaluating the calculated output gap for the months of July, August and September as Joskow and Kahn do not apply Test 1 to measuring available capacity in these periods, yet the higher operating costs during these periods (due to higher gas and NOx allowance costs) could raise the price at which starting such a unit or keeping it on overnight would be economic for a competitive firm.

7. CAISO Dispatch Instructions

There are several respects in which capacity included in the output gap as calculated by Joskow and Kahn might reflect units dispatched down in real time by the CAISO (aside from the ancillary service requirements discussed above) despite bids less than \$120/MWh. First, units submitting \$120/MWh or lower adjustment bids would have average output that is less than their capacity in hours in which the average hourly real-time price exceeded \$120/MWh if prices varied during the hour and the units operated at different levels during the hour. Second, units submitting \$120/MWh or lower adjustment bids could be dispatched down by the California ISO in hours in which real-time prices exceeded \$120/MWh as a result of intra-zonal congestion. Third, units that submitted real-time adjustment bids of less than \$120/MWh but experienced difficulty ramping or maintaining maximum output or were not dispatched by the ISO due to a slow response time could have average hourly output that is less than their maximum output during hours in which real-time prices exceeded their adjustment bid. Fourth, it is a design

¹¹⁹ See Harvey-Hogan, pp. 14-16.

¹²⁰ This evaluation would compare the cost of keeping the unit on overnight or its start-up costs (whichever is lower) to its expected on-peak margin.

feature of the California market that units submitting \$120/MWh or lower adjustment bids would not necessarily be dispatched up by the California ISO in an hour in which the real-time price exceeded \$120/MWh. There is some information available on real-time price variation; however, there do not appear to be any publicly available data that would enable one to assess directly the practical impact of the second, third and fourth effects during the summer of 2000.

Consider first the impact of price and output averaging. The Joskow-Kahn methodology implicitly analyzes the relationship between unit capacity and average unit utilization in the hour. The average output of the unit, however, is limited by the peak output, and thermal steam units such as those analyzed by Joskow and Kahn would likely have been providing load following capability to the CAISO. Thus, a unit might have been fully dispatched at the intra-hour load peak at which the price exceeded \$120, but would be less than fully dispatched on average over the hour if prices fell below \$120/MWh during other dispatch intervals. It is apparently not possible to develop estimates of the potential magnitude of the effect by comparing average hourly load to the intra-hour peak load, because the CAISO does not publish data on intra-hour load levels. The magnitude of the change in average loads from hour to hour often exceeds 1,000 MW on peak days, however, suggesting that differences between peak and average hourly load could exceed 500 MW. Moreover, of the 85 or 86 hours in which both the PX and hourly real-time prices exceeded \$120, 25 were adjacent to an hour in which the hourly real-time price was less than \$120, 15 were adjacent to hours in which the hourly real-time price was less than \$80 and 4 were adjacent to hours in which the hourly real-time price was less than \$20/MWh, suggesting that steam units likely would have been ramping up or down during a number of these hours.

A non-systematic examination of the CAISO ex-post 10-minute prices on high-priced days in June 2000 (www.caiso.com/cgi-bin/pub/mrt2.cgi) reveals instances in which hourly real-time prices (the zonal uninstructed energy price) exceeded \$120/MWh and the BEEP prices ranged from zero to \$400 or more within the hour or within six to eight intervals across hours. It is not surprising that there would be an "output" gap in circumstances in which the dispatch price first falls to zero for 20 to 40 minutes and then suddenly rises.

The significance of this effect has been tested by recalculating the output gap for the hours in which the real-time hourly price was both high and units with bids below \$120/MWh likely would not have been ramping up or down (i.e., hours in which the real-time price exceeded \$120/MWh in the preceding and following hour as well). The results of this calculation are shown in Table 21, and it is seen that although the available capacity of on-line units is 185 MW higher in these hours, output is 590 MW higher so the apparent output gap is reduced by 405 MW (to 1,889 MW), suggesting that a substantial portion of the apparent output gap may be due to units ramping up or down during hours when prices are rising or falling, rather than due to economic withholding.

Table 21						
Output Gap (MW), Adjusted for Outages and Ramping						
Owner	High-Priced RT Hours			Stable High-Priced RT Hours		
	Maximum Output (A)	Mean Output (B)	Output Gap (C)	Maximum Output (D)	Mean Output (E)	Output Gap (F)
NP-15, SF and Z-26						
Duke	2,528	2,416	112	2,535	2,437	98
Southern	2,786	2,300	486	2,816	2,520	296
Total North	5,314	4,716	598	5,351	4,957	394
SF and Humboldt						
PG&E	109	100	9	109	105	4
SP-15						
AES	2,940	2,589	351	2,975	2,643	332
Duke	719	663	56	729	694	35
Dynegy	1,596	1,125	471	1,622	1,235	387
Reliant	3,242	2,424	818	3,319	2,578	741
Total SP-15	8,497	6,801	1,696	8,645	7,150	1,495
Source:						
(A) – (C) Table 17						
(D) – (E) CEMS Data						
(F) = (D) – (E)						

It is also possible to use these data to test whether the calculated outage adjusted output gap in the hours in which both the PX and real-time prices exceeded \$120/MWh is statistically different from the calculated outage adjusted output gap in the hours in which both the PX and real-time prices exceeded \$120/MWh and the real-time price was high both before and after the hour in question. Once again, for the purpose of this test we have dropped the hour included in the Joskow-Kahn analysis in which the hypothetical unconstrained PX price exceeded \$120/MWh but the actual SP-15 PX price was less than \$120/MWh.¹²¹ For the combined North and South regions the mean outage adjusted output gap in the hours in which both the PX and real-time price exceeded \$120/MWh but the real-time price was lower in either the preceding or following hour was 3,017 MW but only 1,881 MW in the hours in which the real-time price exceeded \$120/MWh both before and after the hour as well. The difference is 1,136 MW which is statistically significantly different from zero at above the 99.9 percent confidence level (the t-statistic is 5.40).

¹²¹ This is the reason that the mean for NP-15 used in the test differs slightly from the mean in Table 21.

For the South alone the difference in means is 552 MW (2,045 to 1,493 MW), which is also statistically significantly different from zero at more than the 99 percent confidence level (the t-statistic is 3.35). Finally, for the North alone the difference in means is 584 MW (972 to 388 MW), which is statistically significantly different from zero at above the 99.9 percent confidence level (the t-statistic is 7.54).

Table 22 compares the recalculated output gap in the high-priced non-ramping hours to ancillary service procurement from generation in those same hours. It is seen that the output gap is a few hundred MW less than ancillary service procurement from generation excluding replacement reserves and far less than ancillary service procurement including replacement reserves.¹²² As noted above, generation scheduled to provide replacement reserves might have been dispatched to meet load in real time or might have provided reserves while other capacity was dispatched to meet load. Again, it is seen that the potential variation in the size of the factors included in the output gap is too large, relative to the size of the calculated output gap, to permit findings that output either has or has not been economically withheld from the market.

Table 22			
Output Gap and Ancillary Service Procurement (MW) from Generation by Zone and Region			
June 2000, PX and Real-Time Price > \$120/MWh			
	Non-Ramping Hours		
	North	SP-15	Total
Regulation	347	612	959
Spinning Reserves	494	169	664
Non-Spinning Reserves	196	396	593
Total Excluding Replacement	1,038	1,178	2,216
Replacement Reserves	758	1,095	1,854
Total A/S	1,796	2,273	4,069
Outage Adjusted Output Gap	394	1,495	1,889
North includes NP-15, SF and Z-26.			
Source: Output Gap Table 21.			
Ancillary Service Procurement: www.caiso.com/marketops/OASIS/pubmkt2.html			

¹²² Ramping constraints likely also contributed to an apparent output gap even within the stable high-priced real-time hours. Some of the capacity that is on-line in these hours had only recently come on-line and was likely ramp-constrained in providing energy and reserves. Thus, an average of 150 MW/hour of capacity in these high-priced hours had started up within the prior four hours and roughly 80 MW of the output gap in Table 22 was on these units.

Second, intra-zonal congestion management can require that generators at particular locations be dispatched down by the CAISO despite zonal prices that exceed the unit's bid. In these circumstances, there is a generation pocket in which some resources cannot be utilized to provide either energy or ancillary services. It is therefore possible for generator offers below \$120 to not be accepted for dispatch at times that the zonal price exceeds \$120.¹²³ Because of California's zonal pricing system, the published price data do not indicate whether there were any such generation pockets during the high-priced days in June.

The potential for such output-reducing generation pockets can be seen, however, in the publicly available nodal prices of other ISOs. For example, June 26, 2000 was the highest price day in the New York day-ahead market with prices east of Central East exceeding \$1,000/MWh, yet there were also a number of generation pockets east of Central East with locational prices below \$100/MWh because of transmission constraints that prevented the generation at these locations from being fully scheduled to meet load or to provide reserves.

Third, during high-priced hours in which every unit not providing reserves would ideally be dispatched to its maximum capacity, any inability of units to either ramp quickly up to maximum in the initial high priced hour or to sustain maximum output over a long period of time would translate into an output gap for that unit. Alternatively, a slow responding unit might be skipped by the CAISO and the interval price set by a high-cost unit with a faster response time. There would be an offsetting increase in output by other units including those providing regulation but the source of the replacement output could be units not included in the CEMS data. Fourth, it is a design feature of the California market that the California ISO's real-time dispatch does not clear the market. In particular, the ISO's software has been specifically designed so that it will be the case that if the zonal price is \$120 and there is no intra-zonal congestion, it is possible for there to be adjustment Dec bids above \$120 that have not been accepted or Inc bids below \$120 that have not been accepted. The potential for unaccepted Inc bids below \$120 would likely be greatest if prices were falling. Of the 85 and 86 hours with day ahead and average real-time prices exceeding \$120, 29 were followed by hours in which the average real-time price was at least \$20/MWh lower.

8. Unit Capacity

The Joskow-Kahn study estimates unit capacity based on the maximum output in the quarter. This methodology also introduces imprecision into the calculation of the output gap as it has the potential to either overstate or understate actual capacity. First, it may overstate capacity because it does not account for the impact of ambient temperature on unit capacity. Many of these capacity estimates are based on unit outputs during April and May. Because the capacity of electric generating units can depend on ambient temperature, the Joskow-Kahn methodology

¹²³ Joskow and Kahn assert that "intra-zonal constraints would not affect production levels within a zone" (p. 30), but this is incorrect. This might be true under the simplified assumptions of the zonal model, but it is not true in the real dispatch. So-called "intra-zonal" congestion can be managed by interruptible load and extra-zonal generation as well, and both effects would lead to lower total zonal production. This would be more likely to be true during high-priced hours when all thermal generation units are supposedly already at their maximum level of output.

for estimating capacity has the potential to overstate capacity if the maximum output occurred on a day with lower ambient temperatures. The effect of temperature on capacity, however, would typically not be large for the steam units included in the CEMS data for June.¹²⁴

Second, the Joskow-Kahn methodology for determining capacity could also potentially understate capacity, if part of the capacity of the unit were consistently used to provide reserves, not energy. Thus, if a generation owner consistently bid the top range of one of its units into the market for reserves and submitted a very high energy adjustment bid in real time, it is possible that this capacity could go through the quarter without ever being dispatched.

Third, the Joskow-Kahn methodology for determining capacity, particularly the reliance on the highest output achieved by the unit, even if achieved only in a single hour, has the potential for basing the capacity estimate on anomalous data, atypical operating conditions or output levels that can be sustained only for short periods of time.

Fourth, Joskow and Kahn apparently applied their maximum output methodology on a unit-by-unit basis rather than a station or plant basis. In cases in which some or all of the units composing a station share some facilities, some or all of the individual units may be able to achieve higher than nameplate outputs if the other units in the plant are off-line and the plant is operated to maximize the output of the individual unit. The aggregate of these individual unit outputs could then, however, exceed the capacity of the plant, and capacity estimates based on the sum of the maximum hourly output of the individual units, could overstate plant capacity.

An effort was made to assess the potential direction and magnitude of errors in measuring capacity by comparing the unit capacities estimated based on the Joskow-Kahn methodology with other data on unit capacity. Data on the nameplate capacity of the Mirant units are available on the Mirant website as well as in the Klein and EIA reports, permitting a comparison with the Joskow-Kahn figures as shown in Table 23. For these units the Joskow-Kahn estimate of the capacity of Contra Costa 6 and 7 is 691 MW, which exceeds the capacity figures of 676-680 MW in the other sources. On the other hand, it can be seen that these units operated at the rates used by Joskow and Kahn for a non-trivial number of hours. Joskow and Kahn estimate the capacity of Pittsburgh 1-4 at 645 MW compared to a nameplate capacity of 652 MW in the other sources. These output rates, however, appear to have very rarely been achieved. Joskow and Kahn then estimate the capacity of Pittsburgh 5 and 6 at 663 MW compared to a nameplate capacity in other sources of 650 MW. These units appear to have rarely achieved the capacities used by Joskow and Kahn but did operate above their nameplate capacity for a non-trivial number of hours. The Joskow-Kahn capacity estimate for Pittsburgh 7 is in line with other sources but the unit rarely operated at this level. Finally, Joskow and Kahn estimate the capacity of Potrero 3 at 213 MW compared to a nameplate capacity on the Mirant website and in Klein of 207 MW. It is evident that there is a range in capacity estimates and that the highest output a unit has achieved under perhaps ideal conditions is not necessarily a good indicator of the output it can generate on a consistent basis. The effects are likely not large but reflect an additional increment of output gap in Table 22 that is not appropriately attributed to economic withholding.

¹²⁴ The effect can be large for combined-cycle and combustion turbines but the EPA/CEMS data do not include combustion turbines.

	Maximum Gross Output 1Half 2000 (A)	Hours at Maximum 1Half 2000 (B)	Maximum Gross Output 2Q 2000 (C)	Hours at Maximum 2Q 2000 (D)	EIA Net Summer Capability (E)	Klein (F)	Southern Energy Website (G)	Maximum Gross Output Min 1% Hours (H)
Contra Costa 6	346	227	346	14	339	340	340	346
Contra Costa 7	345	40	345	5	337	340	340	344
Pittsburgh 1	163	1	161	1	163	163	163	160
Pittsburgh 2	163	6	160	8	163	163	163	159
Pittsburgh 3	163	1	163	1	163	163	163	160
Pittsburgh 4	161	8	161	3	163	163	163	157
Pittsburgh 5	332	4	332	2	325	325	325	329
Pittsburgh 6	331	2	331	2	325	325	325	329
Pittsburgh 7	721	1	720	1	682	720	720	716
Potrero 3	213	2	213	2	260	207	207	211
Total	2938		2932		2920	2909	2909	2911

Sources:
 (A) CEMS data, maximum gross unit output Jan 1 – June 20, 2000.
 (B) CEMS data, maximum number of hours rate in Column (A) was achieved in first half 2000.
 (C) CEMS data, maximum gross unit output April 1 – June 30, 2000. Joskow-Kahn.
 (D) CEMS data, number of hours rate in Column (C) was achieved in second quarter 2000.
 (E) EIA, "Inventory of Nonutility Electric Power Plants in the United States 1999," November 2000.
www.eia.doc.gov/cneaf/electricity/ipp/ipp2.pdf.
 (F) Joel Klein, "The Use of Heat Rates in Production Cost Modeling and Market Modeling," April 17, 1998.
 (G) www.Southernenergy.com
 (H) CEMS data, maximum gross output achieved in 1% or more of hours on-line Jan 1 – June 30, 2000.

9. Market Inefficiency

The day-ahead and real-time markets coordinated by the CAISO and CA PX operate in important respects as pay-as-bid markets.¹²⁵ The need for generators to bid the market-clearing price in order to avoid price discrimination applied through the rational buyer rule and ensure that they are paid the market-clearing price creates a degree of market inefficiency that may appear much the same as anticompetitively motivated withholding.¹²⁶ Most of these bidding incentives would not affect clearing prices in a world with perfect foresight. Moreover, these incentives are likely to be more important in the day-ahead markets than in real time. In the real world with imperfect foresight and considerable price volatility, however, the pay-as-bid market

¹²⁵ These features are discussed in detail in Harvey-Hogan, pp. 4-14.

¹²⁶ A critical difference is that the market inefficiency affects the incentives and behavior of all firms participating in the market, not merely the largest net supplier, and can be eliminated only by changing the market design.

features have the potential to create inefficiency and raise prices. For instance, in a simulation of the U.K. market, Bower and Bunn found that switching from a market-clearing to a pay-as-bid auction format increased prices from 100 to 200 percent higher during peak periods.¹²⁷ This outcome is particularly likely in potential shortage conditions in which the price cap is binding. Moreover, it has long been recognized that the real-time dispatch by the CAISO contains artificial restrictions that are intended to prevent the CAISO from undertaking least-cost dispatch and rationalizing the supply and demand for energy in real-time.¹²⁸ The inevitable and intended consequence of these restrictions on least-cost dispatch is to ensure that low-cost generation capacity at times goes utilized in favor of other higher-cost resources. The impact of these restrictions is thereby to restrict output and raise market prices, but this is the intended outcome of the market design, not the result of anticompetitive behavior by market participants.

10. Summary

The output gap calculated by Joskow and Kahn includes the effects of many considerations, including ancillary service requirements, real-time price variations, unit outages, unit deratings, environmental limitations, CAISO dispatch instructions, ramping constraints, effects of minimum load costs, any inability of units to consistently achieve their design capacity and the inefficiency of the California market. All of these effects would show up as economic or physical withholding unless they are accounted for in the analysis. It is seen above that if the output gap is calculated to account for real-time prices, units that are off-line and ramping constraints, the output gap is less than ancillary service procurement from generation other than replacement reserves and far less than ancillary service procurement from generation including replacement reserves or the overall ancillary service requirement, excluding replacement reserves (see Tables 22 and 20). This measure of the output gap still includes the impact of several factors unrelated to economic or physical withholding such as unit deratings, environmental limitations, CAISO dispatch instructions, any inability of units to achieve their design capacity and the inefficiency of the California market. Therefore, the CEMS data do not provide evidence that can distinguish between strategic withholding and other market factors.

At the same time, the calculation of the output gap and ancillary service requirements does not account for the capacity of off-line thermal units such as GTs, reserves provided by hydro or geothermal units or the possibility that the CAISO did not meet its reserve target in all hours. It therefore also cannot be concluded from the demonstration that the output gap is much smaller than reserve requirements, or that all of the capacity included in the output gap was either providing ancillary services, dispatched down by the CAISO, or unable to operate due to unit deratings, environmental limitations or overstated capacities. In other words, the range of error in this approach appears to be larger than the amount of the economic withholding that might have occurred. The result could go either way.

¹²⁷ John Bower and Derek W. Bunn, "Model-Based Comparisons of Pool and Bilateral Markets for Electricity," *Energy Journal*, Vol. 21, November 3, 2000, pp. 1-29. The higher prices arose from both inefficiencies and from the greater exercise of market power. This huge price increase in the U.K. simulations would be unlikely to result in the California market from inefficiency alone, but it illustrates the problems created by market design.

¹²⁸ See footnote 6 above.

V. MARKET DESIGN, PRICES AND INCENTIVES

Joskow and Kahn address a difficult public policy question with publicly available data using two distinct approaches. Both of their approaches face the reality, however, that the range of uncertainty in the publicly available data measuring available capacity, capacity used to provide ancillary services, capacity used to generate energy at the intra-hour peak and capacity dispatched down by the CAISO could exceed the magnitude of any strategic anticompetitive withholding that might have occurred. The CAISO dispatch data would reveal the total available capacity of the on-line units (net of derations, i.e., the upper limit of the units bid in for supplemental energy), and the amount of this capacity that was either used to generate energy, provide ancillary services, or was backed down by the CAISO to manage congestion or balance generation and load. The CAISO dispatch data, moreover, would reveal whether capacity was being economically withheld (i.e., not used to provide energy or ancillary services) in real time during the shortage hours, based on the actual generator schedules and capacity available in each hour. A fundamental limitation of studies based on the CEMS data is that they must be based on very imperfect measures of things the CAISO dispatch data would reveal exactly.

The CAISO dispatch data, however, would not provide the information required to determine whether prices have been affected by physical, rather than economic, withholding. This would require the assessment of the causation of each forced outage or unit derating, assessing the impact of start-up and minimum-load costs on decisions to operate, assessing the impact of annual run restrictions on operating decisions. On this point, the FERC staff has examined outage data for a sample of units and concluded the outages they examined did not reflect physical withholding.

Given the design of the California market, however, even the FERC may not be able to determine from the dispatch data in all instances whether capacity was economically withheld in order to exercise market power, or whether it was economically withheld because of mistaken bids arising from imperfect foresight, which are an inevitable by product of the California market design.

As described by proponents of the California market design: "The ancillary services protocol used in California is strongly dependent on bidders being able to select efficiently between day-ahead energy, ancillary services and real-time markets in selling their scheduled capacity. The primary costs of offering ancillary services to the ISO under the protocol are opportunity costs e.g., the profits foregone in other markets, such as selling into the PX, or offering capacity into the real-time markets without being restricted to providing blocks of reserves. To make efficient ancillary services bids, then, sellers need to be able to gauge their opportunity costs as accurately as possible. Yet this is difficult or impossible given the limited data available."¹²⁹ The result of this market design is that ancillary services prices are probably higher than would be the case in an efficient market, as are the costs of providing these services. The obvious reality is that California market participants have never had perfect foresight and never will. Unless they do,

¹²⁹ Seabron Adamson and Carl Imparato, "Fixing What is Broken: What Steps Are Needed to Complete California's Power Markets?" October 20, 2000, pp. 4-5.

however, the California market will continue to operate the way it does, and action to mitigate market power may be less important than action to fix the faulty market design.

Ultimately, it is impossible to prove the absence of any withholding or any exercise of market power without analyzing the reasons for every outage, derating, and decision not to operate by every supplier, which has not been undertaken by any study. The available information, however, has several elements that suggest that the exercise of market power by California thermal generators is not the primary cause of the high prices in California during 2000-2001. First, electricity prices have been consistently high both inside and outside California, which strongly suggests that the problem is not the exercise of locational market power inside California but a widespread shortage of energy and/or capacity in the WSCC. Indeed, prices have at times been higher outside of California than within California due to transmission constraints on exports. Second, if thermal unit owners were engaged in a simple withholding of generation, then they would not have exceeded the environmental limits on their output. With the benefit of hindsight, it appears indisputable that perfectly competitive thermal generator owners of constrained units blessed with perfect foresight would have offered less capacity into the market from a number of units in many hours during the spring and summer than they actually did, not more capacity, and prices in such a perfectly competitive market would have been higher, not lower, than the actual prices in many of the hours in early 2000. Third, if the high prices in California were attributable to simple withholding by a few thermal generators in California, could these generators be exercising sufficient market power to raise prices off-peak as well as on-peak throughout the entire WSCC?

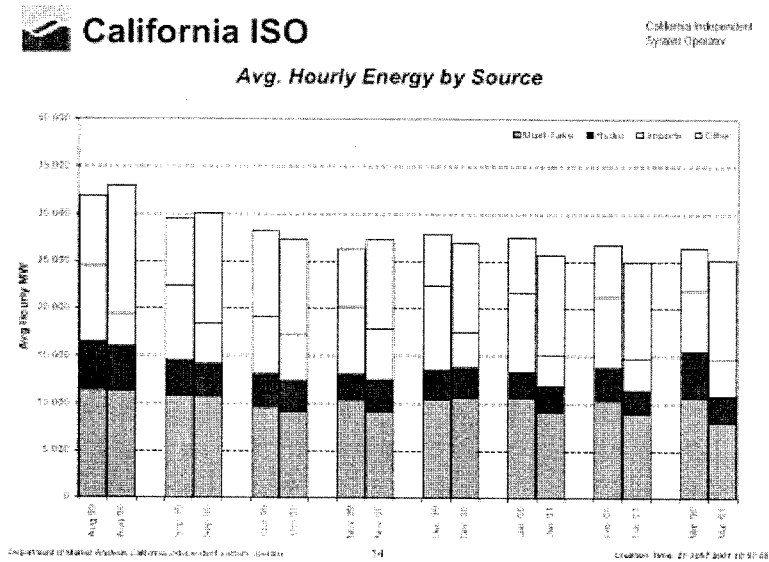
While it is important that allegations of the exercise of market power be carefully investigated, the evidence to date that the high prices in California and the WSCC arise mainly from the exercise of market power by California thermal generators is far from compelling. As Joskow and Kahn have highlighted, many factors contributed to higher prices in California during 2000 and 2001, and the market power theme is only, at most, part of the story. The import of their analysis is not to prove that market power has been exercised but, rather, to suggest that it might be important. The import of the sensitivity analysis here is not to prove that market power has not been exercised but, rather, to suggest that it is unlikely to be the dominant factor and may not even be significant. By contrast, there appears to be little disagreement that other problems of shortage and bad market design are at least large enough to dictate that the solution requires more than just market power mitigation devices. Analysis of the possible exercise of market power should not divert attention from the need for California to:

1. Pay its bills;
2. Raise retail rates, at least at the margin, to reflect the wholesale market price;
3. Assign the financial responsibility for paying electricity bills to someone;
4. Make it clear if and, if so, how, environmental regulations will be modified; and
5. Adopt LMP and reform the wholesale market design.

Similarly, California should provide generators with incentives to contract for gas transportation capacity (spurring the construction of more pipeline capacity), to make investments in emission reductions, to make investments in improved heat rate performance and likely in additional capacity. None of these investments will be made if generators are uncertain of being paid for the electricity they generate or are not permitted to earn a margin above the cost of fuel.

Moreover, generators cannot buy fuel or pay for operations and maintenance if they are not paid for their output. It can be seen in Figure 24 that while the output of thermal generators in California, reflected in the “other” category, has increased dramatically in the winter 2000-2001 relative to the winter of 1999-2000, there has been a corresponding large reduction in the output of California “must-take” generation, as well as hydro and imports. Identifying and reversing the cause of this output reduction ought to be a high priority public policy objective.

Figure 24



Reproduced from Anjali Sheffrin, Market Analysis Report, March 30, 2001.

If the fall in “must-take” generation is largely due to a combination of QF purchase prices that have failed to rise with gas prices and a failure to pay must-take generators for their output, then the recent electricity shortages and accompanying high prices in California (and the WSCC generally) would appear to be in considerable part a consequence of public policy decisions in California.

Even more importantly, it is essential that retail customers be exposed to wholesale market prices at the margin. Despite the rhetoric about inelastic retail demand, San Diego customers

responded to high prices last summer by reducing consumption.¹³⁰ This behavior indicates that electricity is not worth the cost of production to at least some customers. Retail customers in California have been paying electricity prices that are often less than the cost of the fuel and emission allowances required to generate that electricity. This pricing subsidizes consumption and may create distortions in interfuel consumption decisions.

Although the outcome of the current policy debates in California is uncertain, it is likely that one way or another the customers in California will pay for the power that is consumed; however the payment is being repackaged through asset transfers, bond financing with future surcharges, and use of tax revenue. Importantly, these steps do not protect the customers from the high prices; they only hide and disguise the process of assigning the costs.

Hence, retail customers in California will eventually be asked to make up the difference between the true cost of the electricity they are consuming and the current charges. The current pricing system in effect deprives retail customers of choice and ensures that many retail customers will end up paying for electricity that they would not have consumed if they had the opportunity to avoid these costs by reducing consumption.

Worse, if all loads are insulated from market prices in a shortage situation, the price change required to clear the market will be more extreme, perhaps far more extreme, than if loads were to reduce consumption in response to high prices, even if electricity costs were only passed through on a monthly basis. California's effort to insulate electricity consumers from wholesale market prices has aggravated the increase in wholesale market prices by eliminating the load response that would be required to enable the wholesale market to clear at more moderate prices. Moreover, the retail California electricity prices that are below the fuel cost of generating that electricity create substantial risks of artificially increasing electricity demand on the transmission grid by making it cheaper for customers to buy electricity from the grid than to burn gas or oil to self-generate that electricity.¹³¹

The most important step that can be taken to moderate electricity prices in the west is to begin flowing wholesale prices through to California end users for their marginal consumption, rather than continuing to subsidize consumption.¹³² Moreover, it needs to be recognized that end-users

¹³⁰ James Bushnell and Erin Mansur, "The Impact of Rate Deregulation on Electricity Consumption in San Diego," POWER Working Paper PWP-082, University of California Energy Institute, Berkeley, April, 2001. "A program of real-time applied to even half the customers in the ISO system, if it is credibly committed to and properly understood by customers, could produce power savings that allow California to avoid rolling blackouts." (p. 22).

¹³¹ The declining supply of energy from regulatory must-take resources since October 2000 may in part reflect this effect.

¹³² Severin Borenstein, "The Trouble with Electricity Markets (and some solution)," POWER Working Paper, PWP-081, University of California Energy Institute, Berkeley, January 2001. Frank A. Wolak, "A Market (Power) Mitigation Plan for the California Electricity Market," CAISO Market Surveillance Committee Presentation, March 15, 2001.

that reduce consumption and sell that electricity on the spot market are doing exactly what is required to moderate prices in a shortage and should be praised, not criticized and punished.¹³³

Less obviously, the California subsidies for end-user consumption cloud the investment outlook for new electric generating capacity, because it is not clear to investors whether retail customers are really willing to pay the cost of adding electric generating capacity to meet their load. As long as customers are paying subsidized prices for electricity, their consumption decisions provide an uncertain guide for investment decisions. Investment decisions that remove consumer preferences from the decision-making process risk repeating the mistakes of the early 1980s when gas pipelines contracted for natural gas at prices that turned out to be higher than consumers were willing to pay.

It is also important that responsibility for paying electricity bills be clearly assigned to someone -- the end-user, the utility, or whoever -- so that those entities can enter into hedging contracts to insulate themselves from price volatility to the degree that is appropriate. This is also important in avoiding the frequent outcome prior to deregulation in which regulators entered into hedging contracts on behalf of customers at prices above what customers were willing to pay.

New investments in emission reduction are also important in reducing the cost of meeting California electricity demand. The incentives to make these investments will be reduced, and some investments deferred, if it is unclear whether current environmental restrictions on emissions will be relaxed. If there will be some relaxation of emission limits, this should be announced as soon as possible and if there will not be any relaxation, this also needs to be clearly announced as soon as possible. Delaying the decision will delay investments and prolong the impact on market prices. The economics of these investments also depend on the consumer response to high prices, as the easiest way of reducing emissions from high emission plants is not to run them because they are not needed. The longer the delay in flowing through wholesale prices into marginal retail prices the longer the likely delay in making environmental investments as well.

Finally, the designed inefficiency of the California market has directly raised prices and also greatly complicated diagnosis of the cause of the high prices. The California ISO should shift immediately to a bid-based least-cost dispatch in real-time and bid-based least-cost congestion management in day-ahead markets.¹³⁴ Further, the FERC should recognize that directing the CAISO to maintain minimum WSCC reserve levels at any cost has an important impact on the cost of meeting load in a shortage situation. Rather drive out high-cost supply, it would be better

¹³³ See the discussion of Kaiser, *MW Daily*, December 13, 2000, p. 7.

¹³⁴ California Independent System Operator, "Proposed Market Stabilization Plan of the California Independent System Operator Corporation Provided in Response to Letter Order of March 30, 2001," Submission to Federal Energy Regulatory Commission, April 6, 2001. This plan includes some of the suggested reforms, but also introduces other features such as price discrimination between various sources of supply that would likely complicate market operations.

public policy to recognize that every MW of the 3,000 or so MW of regulation and reserves that the CAISO seeks to schedule is not worth \$1,000, \$750, \$500 or \$250/MW.¹³⁵

¹³⁵ This issue is discussed further in Harvey-Hogan, pp. 25-26. See also John D. Chandley, Scott M. Harvey, William W. Hogan., "Electricity Market Reform in California," Comments in FERC Docket EL00-95-000, Center for Business and Government, Harvard University, November 22, 2000.

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IN CALIFORNIA**

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ELECTRICITY MARKET REFORM IN CALIFORNIA
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"...the Commission's goal has been to balance, on the one hand, holding overall rates to levels that approximate competitive market levels for the benefit of consumers, with, on the other hand, inducing sufficient investment in capacity to ensure adequate service for the benefit of consumers. We believe that a well functioning competitive wholesale power market in California, which includes a well functioning regional transmission grid, is a fundamental part of the solution to the supply problems and price volatility in California....

... It is important to get the fundamentals right and to devise a roadmap that takes into account the needs of the market and the regional implications of electricity trade."²

INTRODUCTION

The Federal Energy Regulatory Commission has proposed remedies for the problems observed in the California wholesale markets during the summer of 2000.³ The Commission findings properly emphasize the importance of defects in the California market, which by now has a history of largely unsuccessful reforms. Furthermore, the Commission highlights the need both to address the immediate problems in the market as

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² Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, pp. 4, 18.

³ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000.

well as to initiate a successful redesign process that will lead to a workably competitive regional wholesale market.

The present paper examines the direction laid out by the Commission in light of the available analyses of the problems and the record of the market design process in California.⁴ We submit that the Commission's proposals need substantial clarification, revision and extension. The clarifications should eliminate certain ambiguities in the Commission's guidance, ambiguities that could complicate or completely undermine the Commission's intent. The revisions point to modifications of the short-term transition that would be more consistent with the goal of reforming the basic flaws in the California market design. The extensions focus primarily on the immediate need to embrace the fundamental reforms that are sure to be required and for which further delay could threaten the success of the entire endeavor.

The issues are important for California, but the implications extend well beyond the boundaries of this particular market. The example of the California market is cited in virtually every restructuring policy discussion, and the California market interacts directly with the rest of the electricity market in the Western system. The events have started a process that has produced many attempts to sort out the complicated issues. However, the debate is not likely to be settled through the by now familiar process of the Commission responding to stakeholder initiatives. The current institutions are unlikely to produce workable reforms in California, so the Commission must provide the necessary guidance and direction. Importantly, the Commission has a great deal of evidence and experience to define reforms that would be likely to work.

THE FATAL FLAW

California built its market design on a flawed premise. It is a commonplace that electric systems are both complicated and highly interdependent. Over short horizons of a day or less, generating facilities must work through the transmission network to provide the multiple products of energy, reserves and ancillary services. The same generating facilities must provide all of these products, in the right amounts, and with very limited tolerances. The simple physical reality dictates that these services must, in the end, be coordinated by a system operator. There is no other choice available with our current technology, and every electric system has such a system operator.

⁴ Federal Energy Regulatory Commission, "Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities," Part 1 of Staff Report on U.S. Bulk Power Markets, November 1, 2000. California ISO (CAISO), Department of Market Analysis, "Report on California Energy Market Issues and Performance: May-June, 2000," August 10, 2000. Severin Borenstein, James Bushnell and Frank Wolak, "Diagnosing Market Power in California's Restructured Wholesale Electricity Market," August 2000. Frank A. Wolak, Robert Nordhaus, and Carl Shapiro, "An analysis of the June 2000 Price Spikes in the California ISO's Energy and Ancillary Services Markets," September 6, 2000. Northwest Power Planning Council, Study of Western Power Market Prices Summer 2000, October 11, 2000. California Power Exchange Corp., Compliance Unit, Price Movements in California Electricity Markets, September 29, 2000.

The flawed premise of the California market design was that this inescapable reality could be ignored or minimized in an effort to honor a faith in the ability of markets to solve the problems of coordination. Worse yet, the design of the California market embraced the notion that what little the system operator would do should be done inefficiently in order to leave even more coordination problems for the market to solve. This was an unprecedented experiment in markets that did not work in theory.⁵ We now know that it did not work in practice either.

The failed experiment is at the root of many of the market defects. And the root is deep. The principles have been embodied as part of the so-called "four pillars" of the California market design.⁶ Throughout the review of the market design in the intensive process that began when the Commission identified the "fundamentally flawed" congestion management system, the California Independent System Operator (CAISO) has reflected the will of some stakeholders that above all else the four pillars must be preserved.⁷

These four pillars include:

- The design should "separate the forward energy markets from the ISO forward transmission market."
- The design should "use second-price auction and marginal cost pricing for transmission."
- The design should "utilize the principle of market separation," such as requiring the ISO to preserve balanced schedules for each scheduling coordinator, notwithstanding the ISO's need to adjust these schedules to manage congestion and balance the system.
- The design should "use zonal congestion design where prices within a zone are close enough to use one price for the whole zone."

Only the second principle, to use marginal cost pricing, has a basis in theory or been shown to be workable in practice. Unfortunately, many of the perverse incentives in the California market arise precisely because the ISO is not allowed to apply even this principle consistently. At the same time, the remaining three pillars stand in opposition to the reality of how electric systems must work.

Separating forward energy markets from the ISO's forward transmission markets is a mistake. Over short horizons, there is no distinction between energy dispatch and transmission use. Once we know the dispatch of plants needed to produce energy to meet load, the use of the transmission system is determined. It is a fallacy that these can be determined separately, or that these functions do not have to be carefully integrated to achieve both economic efficiency and reliable operation. Furthermore, this same flawed

⁵ William W. Hogan, "A Wholesale Pool Spot Market Must Be Administered by the Independent System Operator: Avoiding the Separation Fallacy," *Electricity Journal*, December 1995.

⁶ "Congestion Management Reform," presentation by the California ISO, March 17, 2000.

⁷ See, for example, California ISO, Congestion Management Reform Recommendations, Appendix E, July 28, 2000.

market separation principle leads to explicit prohibitions of economic dispatch. The separation of day-ahead transmission and energy markets creates problems that could be and have been avoided elsewhere.

Similarly, the principle of market separation that gives rise to the requirement for individually balanced schedules imposes constraints on operations that are designed solely to create opportunities for otherwise unnecessary transactions for the California Power Exchange (PX) and other scheduling coordinators. Aggregate balancing is required by the physics. But individual balancing is not required, often not efficient, and sometimes not even possible. The restriction is entirely artificial and makes it harder for the ISO to coordinate the market. Moreover, the restriction appears likely to increase the capacity shortage in the California market by increasing the CAISO's demand for capacity (to provide regulation) and requiring market participants to withhold capacity from the energy markets in order to provide adjustment bids.

Likewise, the zonal pricing system defines a requirement that should not be a requirement at all given the conditions in its definition. If the (true) prices in a zone were "close enough," there would be no need to convert them to one price. Furthermore, we know by now that the implied simplification of the zonal system was a mirage, and its implementation requires more and more complex contortions to counteract its perverse incentives. The real impact of zonal aggregation is to convert (true) prices that are not close into a single price that gives the wrong incentives just when incentives matter most.

These ill-advised pillars have trapped California in a box that excludes meaningful market reform. The Commission has recognized some, if not all, of the pathologies that fester inside this box. As the Commission has noted, the separation of the roles of the ISO and the PX in dealing with short-term coordination is a source of continuing trouble. The requirement for individually balanced schedules, rather than a collectively balanced system, serves no good public policy purpose. The prohibition against economic dispatch in real time necessarily reduces efficiency and forecloses a market-based option that is fundamental to workable markets in other systems. The continued pursuit of "simplified" zonal designs, that are truly complicated in practice, reflects the perverse philosophical commitment to preventing the CAISO from doing well what it must do of necessity. The initial complete and still partial separation of markets for energy, reserves and other ancillary services imposes demands on market participants, and on the supply of generating capacity, that could be alleviated easily in the use of a combined optimization that only the CAISO could perform.

The recitation of design defects attributable to the flawed pillars could be extended.⁸ But even this short summary of the experience in the reform process, and the continued adherence to the fatally flawed premise of the California market design, presents the Commission with an unhappy combination of circumstances. First, the California market will not be amenable to reform without stepping outside the constraints imposed by the flawed pillars. Second, the California participants have demonstrated

⁸ See, for example, Scott Harvey and William W. Hogan, "Comments on the Congestion Management Proposals of the California ISO," August 31, 2000.

repeatedly that they cannot take this step on their own, and will not allow the ISO management to take it for them.

The Commission, therefore, will have to take the initiative to drive the process in the right direction. This is essential for several reasons. The obvious importance of the California market should be enough to declare an end to the failed experiment and turn to a superior market design in place elsewhere that has proven itself in both theory and practice. Furthermore, the example of California is unavoidable in establishing precedents or creating obstacles for the development of Regional Transmission Organizations (RTOs) in other regions. Without a fundamental correction in California, the Commission will face serious complications in the development of workable regional markets well beyond the borders of California.

There is an understandable focus on high prices and efforts to mitigate the impact on California consumers. Near-term efforts to define just and reasonable prices receive immediate attention, often at the expense of efforts to correct the underlying flaws in the market. But even here the design flaws intrude. They confound diagnosis and treatment of the market ills in California. Initially, high prices in California were seen as *prima facie* evidence of the exercise of market power. However, closer examination of the structure of the market and its rules reveals a more complicated story that implicates the interaction of bad market design and shortage as at least a prominent feature of the California experience.⁹ Without the fundamental reforms in market design, it may be impossible to separate the effects of market power from these other elements. And without a better diagnosis, it is hard to know what treatments to prescribe to mitigate market power, or even if market power is a part of the problem. Furthermore, if the real problems have been a combination of a shortage of capacity and high cost energy, market reform may be essential to achieving just and reasonable prices.

Direction from the Commission should be specific and comprehensive, both as to the final destination and the path for transition. The Commission's recognition that it must confront the difficulties of market design is a promising start, but more is required. It must now get the market design right and ensure that the flawed market design elements now evident in the California structure are not allowed to take root in the emerging RTOs elsewhere.

THE COMMISSION'S PROPOSALS

The Commission has reviewed the accumulated experience in California and produced a series of proposed actions for the immediate future and for more fundamental reform. The initial actions include:¹⁰

⁹ Scott M. Harvey and William W. Hogan, "Issues in the Analysis of Market Power in California," October 27, 2000. Federal Energy Regulatory Commission, "Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities," Part I of Staff Report on U.S. Bulk Power Markets, November 1, 2000.

¹⁰ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, p. 5.

- the elimination of the requirement that the three investor-owned utilities (IOUs) -- Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SoCal Edison), and San Diego Gas & Electric Company (SDG&E) -- must sell into and buy from the PX;
- the addition of a penalty charge for deviations in scheduling in excess of five percent of an entity's hourly load requirements and the disbursement of penalty revenues to the loads that scheduled accurately;
- the establishment of independent, non-stakeholder Governing Boards for the PX and the ISO;
- the establishment of generation interconnection procedures; and
- a new form of "soft" price cap at \$150.

Further, the Commission identified a number of structural reforms that must be addressed, including:¹¹

- the submission of a congestion management redesign proposal;
- possible changes to the auction mechanisms;
- improved market monitoring and market mitigation strategies;
- demand response programs by the ISO and Scheduling Coordinators;
- elimination of the requirement for balanced schedules; and
- new approach to reserve requirements.

This is an ambitious agenda, pointing towards undertaking a comprehensive redesign of the entire California market structure. It raises many questions that could lead to extensive discussion and debate. However, in making the case that the agenda is not prescriptive enough, it is better to concentrate on the main points. These observations will serve as a backdrop for the clarifications, revisions and extensions that we see as dictated by the Commission's analysis and the serious problems that remain.

Governance

The California governance arrangements have failed to meet the basic test of operating success. The governance mechanism that produced the flawed initial market design evolved into the stakeholder boards of the CAISO and the PX. As is now clear, this governance mechanism has been unable to correct, or even acknowledge, its initial mistakes. The Commission has concluded that California needs a new, more independent, governance mechanism. This is an important step that will have major impacts both inside and outside California.

Whatever the necessity of improving the governance of market institutions in California, there is little reason to hope that this alone will be sufficient to ensure timely

¹¹ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, p. 5.

or sensible reforms. Responsibility for the existing problems in California rests not just with its governing bodies. Regulators in Washington and California accepted and approved the defective market design, albeit at a time when there was little experience with operating electricity markets in the United States. The most important guidance regarding improvements of these market designs is not likely to come from the as yet unnamed new boards, especially given the delay in their arrival on the scene and the natural requirement that they will spend time understanding the current market institutions and problems, and making their own mistakes. In the meantime, the Commission must do the hard work of sorting through market design issues and weeding out designs that have failed from those that have proven to be workable.

Sole reliance on the new boards to do the hard work for the Commission could be further complicated by the guidance the Commission has given as to the composition of these Boards: "[t]he Boards should include members with experience in corporate leadership (at the director or board level) or professional expertise in either finance, accounting, engineering or utility law and regulation. The PX board should include members with expertise in areas of commercial markets and trading. The ISO board should include members with experience in the operation and planning of transmission systems."¹² This could be interpreted as direction for the expertise sought separately for the CAISO and PX boards to preserve a distinction in their functions that would codify the fatal flaw of market separation. This would be a mistake. In particular, the CAISO functions should include the necessary understanding of what needs to be done in the management of short-term operations to support both reliability and markets.

The change in governance may help, but it is not likely to be decisive in the near term. Explicit guidance from the Commission regarding the nature and trajectory of reforms will be essential if market reform is to be accomplished within an acceptable time frame.

Market Separation

The flaw of market separation receives attention from the Commission in its direction regarding the functions of the CAISO and the PX. The Commission proposes with one hand to abolish the requirement for utilities to purchase solely from the PX, and it asserts that it wants to eliminate the balanced schedule requirement. But with the other hand the Commission reinforces the artificial distinction between the energy market and transmission management: "We propose to temporarily correct the current situation by limiting the ISO to only the functions needed to reliably operate the transmission system, *i.e.*, provide a balancing service rather than running an energy market."¹³ In addition, as discussed above, the Commission may be construed to having directed the new independent Boards to have correspondingly different expertise. Further, in its detailed discussion, the Commission requires not the elimination of balanced schedules but no

¹² Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, pp. 28-29.

¹³ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, p. 24.

more than that the PX and the CAISO discuss in the future how to better integrate the day-ahead markets.¹⁴ The Commission is silent on the contradictions of these ambiguous instructions and fails to address the impact of the market separation requirement on the capacity shortages in California.

Further, in its discussion of the use of spot markets the Commission wrongly focuses on the symptoms rather than the disease. The symptom is the so-called underscheduling in the day-ahead market and greater reliance on the spot market. The pathology is the market structure that gives the wrong price signals to the participants and forces inefficiency that contributes to a capacity shortage. If the prices were right, there should be no need for penalties or special rules to force market participants to act in ways that go against the market incentives. As we have seen in other markets, it is possible for day-ahead and real-time markets to work without special penalties or rules and without the pathologies present in California.

The ambiguity in the guidance and the confusion it will create are a recipe for delay and further *ad hoc* reforms. The Commission should face the reality of electricity systems and the extensive analysis that supported its directions in Order 2000.¹⁵ The CAISO should be given the clear responsibility to run an efficient day-ahead and real-time market, in support of an efficient competitive market. Pricing rules in each market should be based on standard marginal cost principles and be consistent across markets. Any attempt to straddle the four pillars and maintain market separation is bound to fail. There should be an unambiguous decision and direction to give the CAISO the responsibility to operate an integrated system for day-ahead and real-time scheduling, balancing, congestion management, ancillary services, reserves, and so on, recognizing that these and their associated pricing must be parts of an integrated whole.

Forward Contracting

Freeing utilities from restrictions on forward contracting is a move in the right direction. In a real market, there would be no such restrictions. The arguments for the restrictions in the first place were at best problematic. Whatever the original merits, the arguments depended in part upon other market reforms that would allow for vigorous competition to serve retail loads. These other reforms were not put in place. In addition, the well documented effect of the rate freeze and stranded asset recovery mechanism created the worst possible combination of small customers left *de facto* without access to retail suppliers who could provide price stability, and utilities precluded from providing any hedging services.

Removing the restrictions on forward contracting is one thing. Putting formal requirements or informal pressure on buyers to sign long-term forward contracts would be quite something else. The expectation that merely allowing utilities to participate in

¹⁴ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, p. 30.

¹⁵ William W. Hogan, "Regional Transmission Organizations: Millennium Order on Designing Market Institutions for Electric Network Systems," May 2000. (available at ksgwww.harvard.edu/people/whogan).

forward contracting necessarily would be the solution to high prices is problematic and not supported by the Commission's staff report. "[H]olding forward contracts does not guarantee that consumers will incur lower total energy costs. These costs ultimately depend on the relative level of prices in the forward and spot energy markets."¹⁶ To the contrary, putting pressure on buyers to sign contracts in the present environment may make things worse. It is doubtful that requiring buyers to sign forward contracts would improve matters if the high prices are largely due to the exercise of market power,¹⁷ and if the high prices are largely due to high costs and capacity shortages, requiring California buyers to sign forward contracts could make things worse not only in California, but in a broad part of the Western system (WSCC).

Forward contract prices after Summer 2000 were much higher than for the Summer 1999, and a regulatory requirement that buyers increase their demand for such contracts can only be expected to make the contract price increase. Furthermore, the complications of getting the utilities back in the long-term supply business have been ignored. A rush to extensive long-term forward contracting now may be closing the barn door too late. A return to new but strangely familiar stranded cost hearings may not be far in the future. One of the purposes of electricity market reform was to provide customer choice. It would be inconsistent with this purpose if the distribution utilities were to be required to enter into forward contracts to buy electricity at prices that may turn out to be much higher than what customers are actually willing to pay for that power. Recall the natural gas markets in the 1980s with high contract prices that precipitated the restructuring of the gas industry.

It is not clear that the Commission's proposal would require long-term forward contracting. The language about forward contracting and the emphasis on real-time penalties could be interpreted as applying only to day-ahead scheduling.¹⁸ If this is the Commission's intent, it should be clarified. If not, then the role of long-term forward contracting deserves much more examination before committing to a new round of sunk costs.

The Commission should on the other hand take steps to eliminate artificial barriers to forward contracting and ensure that competitive electricity providers are able to participate in the market and offer load management services to end users.

Soft Price Cap

The soft price cap proposal is novel and raises many new issues. It does not appear in the staff report and there is little critical analysis of the implications, other than

¹⁶ Federal Energy Regulatory Commission, "Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities," Part 1 of Staff Report on U.S. Bulk Power Markets, November 1, 2000, p. 5-9. See also, Scott M. Harvey and William W. Hogan, "California Electricity Prices and Forward Market Hedging," October 17, 2000.

¹⁷ Scott M. Harvey and William W. Hogan, "California Electricity Prices and Forward Market Hedging," October 17, 2000. (available at ksgwww.harvard.edu/people/whogan).

¹⁸ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, pp. 24, 41.

the discussion of Commissioner Hébert. Essentially the soft price cap appears to be an attempt to straddle two auction price regimes, with market-clearing prices applying below \$150 and pay-as-bid systems applying above \$150. Below \$150 it would seem that any price would be acceptable. Above \$150, there would at least be requirements for further review by the Commission and possible refunds.

It is uncertain what is intended. One possibility is that the Commission intends to require and enforce cost justification for all bids in excess of \$150. If this is the intent, the proposal in effect lowers the existing price cap and formalizes the CAISO practice of making out-of-market purchases in order to obtain supplies available only at prices above the price cap.¹⁹ In this case, the Commission should recognize that requiring cost justification of generator bids, particularly under a pay-as-bid system, will impose substantial burdens on the Commission that would rival those under wellhead price controls in the natural gas industry. Some of the issues the Commission and its staff would have to address include:

- Would fuels be priced based on their acquisition price or their current market price?
- Would emission allowances be priced based on their acquisition cost or their current market price, and how would market prices be determined?
- Would firm transportation charges be included in costs, and if so how, or only interruptible (and thus avoidable) gas transportation charges?
- How would the cost justification account for start-up and no-load costs?
- How would the opportunity costs of limited energy resources such as pondage hydro be measured?
- How would expected ancillary services prices be evaluated in measuring opportunity costs?
- How would imports and exports be priced?

Moreover, even if this regime were successfully applied the price discrimination and price averaging implicit in the pay-as-bid market structure would likely deter, rather than promote, forward contracting. Finally, such a cost based approach would appear to deter investments in new capacity, improved heat-rate performance, and reduced emissions, all of which will not be made unless they earn more than their short-run costs and all of which are necessary if California is to address the three problems of capacity shortage, high gas costs and high emissions.

Alternatively, the soft price cap might be truly soft and not require cost justification. Hence, there would be no price cap for any entity that is willing to file a report to FERC and face the possibility of a refund. If this is the Commission's intent,

¹⁹ Commissioner Hébert for one is concerned that this requirement would act as a *de facto* price cap at \$150. See Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Concurring Opinion of Commissioner Hébert, Docket No. EL00-95-000, Washington, DC, November 1, 2000.

there might be little impact on consumer prices (particularly if the principal sources of those high prices are high costs and regional capacity shortages rather than the exercise of market power). Even so, the proposal might serve to deter entry and new investments, thus combining the worst of both worlds, high consumer prices and little or no new investment.

As with any price cap, the incentives run against the operation of markets and make the mechanism a source of complication in achieving a transition to a more market-like mechanism. It would be especially problematic for prospective new entrants. Consider a competitive existing generator with production costs below but opportunity costs above \$150. The opportunity costs should set a floor on its bid in a competitive market. Under a truly "soft" price cap, the risk for such an entity of bidding above \$150 would be limited to the cost of filing and review by the Commission, plus the possibility that a refund may be required to return its short-run operating profits in excess of \$150. There would be no rational reason not to bid the supplier's opportunity costs, as the worst case outcome would be no worse than if it did not try to capture its opportunity costs in its bid. By contrast, consider the new generator that needs a significant number of hours with revenue above \$150 to justify the fixed costs of building a plant and entering the market. No matter what the Commission says now, the new generator (or the generator contemplating closing a plant, or a generator contemplating an investment to improve generating performance or reduce NOx emissions) would face a larger maximum risk and would have to evaluate the chance that it would make a cash investment and then not recover its required return. In this case, it is not simply a matter of failing to capture its opportunity costs and being no worse off than if it had not tried, because the ability to capture opportunity costs may have provided the basis for an investment that would be sunk and would fail to recover its cost of capital. It is easy to imagine that this soft price cap would have almost the same effect as a hard price cap for such entrants, namely discouraging new entry. Given the short supply situation, this would be just the wrong incentive.

In addition, a soft price cap would face the same problems of any pay-as-bid market. To the extent that shortage is driving the high prices in California, this rule would indirectly reinforce the problematic features of bidding and scheduling.

Auction Mechanisms

The Commission expressed an interest in the possible benefits of switching to a pay-as-bid auction format rather than the originally intended design of a uniform price auction. Electricity markets that rely on uniform price auctions to clear markets exploit a simple argument based on the law of one price. The law of one price says that in a decentralized market for a homogeneous commodity, trade will tend to converge towards a common market-clearing price. In the case of electricity, where decentralized trading is foreclosed in the final day-ahead and real-time markets, this convergence is not possible and the simple approach is to use what the market would produce if only there were enough time and no transaction costs.

Whenever these uniform price electricity markets encounter trouble for any reason, someone notices that market participants are responding to the incentives of the uniform price auction by bidding something below the market-clearing price. They then

leap to the *non sequitur* that paying the bid rather than the market-clearing price would somehow reduce average prices. A moment's reflection would suggest that the same market participants who respond to the incentives of the uniform price auction would also respond to the incentives of the pay-as-bid auction. Now the incentive would be to bid the market-clearing price.

As the staff report summarizes, the results would be the same price and revenue flows as under the uniform price auction.²⁰ This assumes, however, that there would be no uncertainty and no transaction costs. In the presence of uncertainty and transaction costs, there will be errors in the bids. The one sure thing that these errors will produce will be higher true costs through inefficient choices in the ultimate dispatch. There is no available evidence that the result would be lower prices. There are studies that suggest that both costs and prices would be higher.²¹

This general observation applied to any commodity auction applies with special force to something as complicated as the bids for a security-constrained economic dispatch. We saw what could happen in such a market when California operated fully separate energy, reserve and ancillary services markets.²² In effect, this was an approximate prototype of a full pay-as-bid market. It was a stunning failure, the first in a line of special California problems. To cite another complication, consider the problems of transmission congestion management if everyone is bidding to make sure that the bid is close to the market-clearing price. For example, in PJM the presence of transmission congestion can change the market value of generation by an order of magnitude. Every generator would be compelled to consider the likelihood of transmission congestion in each interval, and change its bids accordingly. This embrace of a pay-as-bid rule would be a nightmare for the system operator and the competitive bidder, but a godsend for any generator who wished to cloak the exercise of market power.

Market Power and Shortages

High prices in the summer of 2000 arose because of a combination of factors. Faulty market rules created both inefficient dispatch and incentives for behavior that complicated market operations. Costs were up due to higher natural gas prices and tightening markets for emission allowances. Capacity was reduced because of the low availability of hydro power, a failure to invest in generating capacity in California, and increased congestion in the transmission system. Demand in areas not exposed to market prices grew at a rate that surprised most observers. On these points there is no dispute. In addition, there are those who argue that the high prices were exacerbated by the exercise of market power.

²⁰ Federal Energy Regulatory Commission, "Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities," Part 1 of Staff Report on U.S. Bulk Power Markets, November 1, 2000, p. 5-15.

²¹ John Bower and Derek W. Bunn, "Model-Based Comparisons of Pool and Bilateral Markets for Electricity," *Energy Journal*, Vol. 21, No. 3, pp. 1-29.

²² Scott M. Harvey and William W. Hogan, "Issues in the Analysis of Market Power in California," October 27, 2000. (available at ksgwww.harvard.edu/people/whogan).

The need to fix badly flawed markets should be beyond dispute after the evidence of the failed experiment in California. The impacts of increased production costs and shortages are easy to understand, if not pleasant to endure. Markets respond to scarcity by increasing prices, and the increase in price creates the incentives for adjustments in supply and demand. Were it not for the large wealth transfer, the analysis of the proper response to scarcity would lead to the uncontroversial conclusion to let the market work.

The controversy in California centers more on the role of market power, and separating how much of the increase in prices is the result of the exercise of market power versus how much is from the more conventional explanation of scarcity, albeit scarcity created in part by the market design. In this regard, the debate is confused because we are dancing around the words where the truth may be hard to face. The confusion is evident in the Commission's summary of its findings and conclusions: "[w]hile this record does not support findings of specific exercises of market power, and while we are not able to reach definite conclusions about the actions of individual sellers, there is clear evidence that the California market structure and rules provide the opportunity for sellers to exercise market power when supply is tight and can result in unjust and unreasonable rates under the FPA."²³

The traditional definition of the exercise of market power would apply to circumstances when generators withhold some capacity and leave it idle in order to raise the market price. The withholding suppliers are presumed to make more money through the increased price on what they do supply than they lose on the supply they withhold.²⁴ There is an unambiguous policy conclusion regarding this exercise of traditional market power. If it is occurring on any significant scale, it is a problem and regulatory intervention is indicated. The preferred mechanisms would be through bids caps, or divestiture, applied to the offending suppliers, as discussed below.

The difficulty in the present case is that there has been no direct showing that such traditional market power has been exercised at all, much less that it has been exercised on a widespread and significant basis.²⁵ The often mentioned tendency of generators and loads to avoid the day-ahead market in preference to the real-time market is a response to bad market design and pricing incentives (including price caps), but does not demonstrate the exercise of market power. If these participants ultimately transact through the real-time market (for either energy or reserves), there is no final withholding of capacity. Even a 1 MW generator would have an incentive to follow these incentives. This is not the traditional exercise of market power.

²³ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, p. 3.

²⁴ In the presence of transmission bottlenecks, it is possible to exercise market power by increasing some supply in order to force reductions elsewhere, but this does not change the thrust of the present argument.

²⁵ Scott M. Harvey and William W. Hogan, "Issues in the Analysis of Market Power in California," October 27, 2000, pp. 2-4. Federal Energy Regulatory Commission, "Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities," Part 1 of Staff Report on U.S. Bulk Power Markets, November 1, 2000, p. 5-16.

In contrast, sometimes the term "market power" is applied to something else in analyses of the California experience. This is clearest in the discussion of market power with the occasional cryptic reference to the definition: "[t]he data also indicate some attempted exercise of market power, if the standard of bidding above marginal cost is used,..."²⁶ This definition flows from a view that the California market is a pure uniform price auction and that bidders without market power should bid their own opportunity cost. However, there are several translation steps that are implicit and problematic in this definition.

The distinction between direct marginal cost and opportunity cost is sometimes lost in the discussion. Hence, a competitive bidder whose direct cost of generation is \$40 but who could sell the same energy outside California for \$100 should bid no less than \$100. This would not be an exercise of market power. Furthermore, the California market is not a true uniform price market. In fact, the many peculiar design features in the California market mean that the market-clearing price in related markets, such as ancillary services, should determine the opportunity cost in others. Hence, even a small 1 MW generator should be anticipating the willingness to pay of the market and try to bid so as to ensure that it is paid the market-clearing price. Under the California rules, the rational bid of the competitive generator can easily be to pick the largest price at which it will still be called into use. This is not withholding, it is a rational response to market incentives. To the extent that this is caused by market design problems, fixing the design should change the bidding behavior. To the extent that the market-clearing price is due to scarcity, however, the resulting price impacts and behavior of the bidders is consistent with what we would expect in a competitive market and cannot be avoided without eliminating the market.²⁷

Dispelling the semantic fog should be a high priority for the Commission. If there is significant exercise of traditional market power through withholding, this has important policy implications. The preferred response would be bid caps targeted at those exercising market power in the short-run and divestiture in the long-run, and this action alone might be sufficient to moderate the average price impacts. However, if the explanation lies elsewhere, the policy implications would be different. If scarcity and higher costs are the dominant forces, bid caps on large suppliers and divestiture would have little, maybe no, impact on the outcome of prices and production. Most importantly, price caps that appear more justifiable in the presence of traditional market power become exactly the wrong approach in dealing with scarcity.

Other Proposals

The Commission identifies a number of other initiatives that seem important, uncontroversial, and overdue. These would include the promotion of greater demand-side response, improved congestion management, establishment of non-discriminatory

²⁶ Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Docket No. EL00-95-000, Washington, DC, November 1, 2000, Appendix D.

²⁷ Scott M. Harvey and William W. Hogan, "Issues in the Analysis of Market Power in California," October 27, 2000. (available at ksgwww.harvard.edu/people/whogan).

interconnection procedures, enhanced market monitoring, and full implementation of an effective RTO that complies with the spirit of Order 2000.

MARKET REFORMS

The list of necessary reforms for the California market is long, and the difficulty of identifying and fixing all of the problems has been exacerbated by repeated *ad hoc* reforms that have dismissed theoretically sound and proven design principles. A transition will be necessary, but it must be guided by a set of principles that are consistent with a workable, efficient, and sustainable market. The necessary principles have been articulated in a number of different forms and forums.²⁸ Here we restate and summarize the key principles and their rationale before addressing the transitional steps that will be needed in the near term.

1. *The ISO must operate, and provide open access to, short-run markets to maintain short-run reliability and to provide a foundation for a workable market.*

These short-run markets include, at a minimum, the real-time balancing market associated with the real-time dispatch, along with associated ancillary service markets – for regulation and operating reserves -- necessary to maintain reliability. A bid-based real-time dispatch is the means by which the ISO provides a real-time balancing and spot market, maintains system balance, and provides economic redispatch to manage congestion. We restate this principle first because it has been only weakly embraced in California and is now further threatened by misguided attempts to solve the problem of “underscheduling,” a phenomenon whose causes lie elsewhere and whose solution does not require limiting access to an essential market.

While the ISO’s real-time dispatch provides the most essential of all short-run reliability functions – it is the true “provider of last resort” in all electricity markets -- the real-time spot market that flows from this dispatch provides the cornerstone for an effective, workable market. Real-time spot prices provide a reference for writing forward contracts and effectively eliminate the problem of liquidated damages when either party fails to perform (i.e., to generate or consume) as expected. Access to this market allows contracting parties to avoid the burden and expense of precise or even approximate load following. Imbalances are simply supplied or absorbed by the ISO’s real-time dispatch and the parties are simply settled at the market-clearing spot prices that flow from that dispatch. With an open spot market, moreover, generators have a ready market for their uncontracted output, and loads have a dependable market to obtain energy to meet their uncontracted demand. Hence, the ISO’s real-time market is not just a “balancing market,” it is an open spot market that provides important options for all market participants and a standard reference and backup for forward contracting.

²⁸ For example, see the 17 design recommendations submitted to the Commission by San Diego Gas and Electric Company. “Comments of San Diego Gas and Electric Company on Order Proposing Remedies for California Wholesale Electric Markets, Attachment A,” filed November 22, 2000.

In California, this necessary cornerstone of an effective market has been undermined by rules that prevent the ISO from performing an efficient economic dispatch. An efficient dispatch would follow from the voluntary submission of bids from generators and dispatchable loads and the logical, efficient use of those bids by the ISO to arrange a security-constrained, economic dispatch. Such a dispatch would simultaneously balance the system, clear the market and redispatch generators to relieve all congestion, and do so at the lowest as-bid cost, given the bids and the constraints that had to be honored. Security-constrained economic dispatch is the bedrock principle of efficient electricity operations, and it should be the foundation for an efficient real-time market. Yet current market rules in California prevent the ISO from attempting an economic dispatch when the system is congested, instead forcing the ISO to deviate from an unconstrained merit-order dispatch only enough to relieve the constraint but no further, even if a more efficient –i.e., lower-cost – dispatch is possible given the bids. The Commission should direct the ISO to remove this “minimum shift” restriction on economic dispatch immediately.

Once the Commission removes the restrictions on an economic dispatch, it should also ensure that all parties have open, unlimited access to the associated spot market. Unfortunately, the Commission proposes to embrace one of the fundamental design flaws of the California market by imposing penalties and other measures to discourage parties from using the ISO’s real-time spot market. Rather than seeing the real-time spot market and open access to that market as the cornerstone for a much broader market, the California philosophy has mistakenly regarded the real-time spot market as a “residual” market necessary only for maintaining real-time reliability. Any use of that market beyond some arbitrarily low level is deemed to be a problem. This is a mistaken view, incompatible with the important role played by the spot market.

The Commission now proposes to approve this flawed, narrow view and to enforce it by penalizing parties that deviate from their forward market schedules by more than five percent. Indeed, the Commission seems dismayed that the market’s voluntary use of the ISO’s real-time market has “forced the ISO to operate a market,” as though the operation of real-time spot markets by ISOs were a novel approach and incompatible with Commission policy and sound market design. This is dangerous view that will only foster restricted, inefficient markets in every RTO.

The Commission should recall that until June of this year, the PJM market, to which the Commission has repeatedly pointed as a model for emulation, consisted of a real-time spot market based on voluntary bids submitted to the ISO in conjunction with arranging a security-constrained economic dispatch. All “forward” markets were entirely bilateral and voluntary, as there was no bid-based forward energy market operated by PJM until June 1, 2000. The key features of the PJM spot market were (and continue to be) open, unlimited access, without penalties. Parties are free to use this spot market to any degree consistent with their commercial interests, and they are entitled (obligated) to receive (pay) the spot market prices for the quantities they sell (purchase) in that market. The success of this open spot market and the important role it plays in supporting the overall PJM market structure were surely understood by the Commission when it declared in Order 2000 that open, non-discriminatory access to a real-time balancing

market is necessary to achieve non-discriminatory access to transmission. And this is clearly why a real-time balancing market is a required function of every RTO.

Since June, PJM has also operated a day-ahead market in which parties can bid to buy and sell energy and transmission in an integrated market with consistent pricing. Any yet parties are free to use the forward market or not, and rely on the real-time spot market or not, as best suits their commercial interests. The parties are not penalized for their choices, beyond the requirement that they be settled at the market-clearing prices in whatever market they use.

Both the California ISO and the Commission now seem preoccupied by the fact that substantial percentages of load (and generation) often “underschedule” in the ISO forward markets and show up only in the real-time market, forcing the ISO to scramble to arrange sufficient resources to meet the real-time demand when real-time prices are soaring. The Commission should recognize that it is not “underscheduling” that caused real-time prices to soar or the ISO to have to scramble to meet real-time demand but the high energy prices and capacity shortage. Neither of these problems is solved merely by scheduling resources day-ahead. Indeed, there has been no demonstration that the external resources that were actually made available in real-time to allow the California ISO to meet real-time load would or even could have been offered in the day-ahead markets in which it would be mandated that loads cover their demands.

The reality is that markets do not work well in shortage conditions, particularly when price controls are in place. Underscheduling is merely a symptom of the other more fundamental problems, high energy prices, capacity shortages, and binding price controls. Treating the symptom of underscheduling is in practice a decision to do nothing and to hope for falling gas prices, high hydro-conditions, or a recession to solve the problem.

As the Commission recognizes, this problem of “underscheduling” is in part peculiar to the California market design and pricing rules and is not a serious problem in PJM. Curing the problem of “underscheduling” is thus a matter of fixing the California rules, not restricting access to an essential market. California artificially separates its forward markets for transmission (ISO) and energy (PX), and hence artificially separates its forward energy market from its real-time market. The ISO and PX then use different pricing rules -- including different price caps -- in their respective markets. For example, a higher price cap in the PX forward markets than the ISO uses in real time provides a strong incentive for load-serving entities to “underschedule” loads in the PX market so that they can gain the protection of the lower price cap in the ISO real-time market during high-price hours. From the loads’ perspective, this is not “underscheduling;” it is rational scheduling in the market expected to have lower prices.

In PJM, or the similar market in New York, the incentives tend to be the reverse. While there are no explicit penalties for using the real-time spot market, there are reasons why the real-time prices may be higher if substantial quantities of loads bypass the day-ahead market and show up in real time. Moreover, the PJM and New York ISOs has an important tool -- a tool that the California market designers deliberately forbade the ISO to use -- that it can use to ensure reliability, even if substantial loads show up in real time.

For example, the PJM ISO offers a voluntary unit commitment service based on three part bids. Generators that wish to self schedule their units may do so, but those who wish to have their unit commitment optimized by PJM may submit bids that indicate not only their incremental energy prices but also their start-up costs and minimum generation costs. PJM then optimizes the unit commitment and ensures that enough units are committed to meet the ISO's independent forecast of total loads for the following day. Units that are committed must start up and/or be available on short notice, even if the load does not materialize and the units are not run. If they are not dispatched, or are not dispatched long enough to receive enough revenues at the market-clearing prices to recover their start-up and minimum generating costs, they are made whole. Hence, generators have an incentive to be available if needed.

In arranging the next-day's dispatch, PJM will optimize for all bid-in costs to meet the bid-in load. However, to meet the additional load that it forecasts but that did not bid in or schedule in the day-ahead market, the ISO will commit additional resources but optimize only to minimize start-up and minimum generation costs (but not incremental running costs). Thus, if the additional load shows up in real time, the PJM ISO will have committed enough resources to meet the total load reliably, but the market price may well be higher in real time. The reason is that the additional committed resources will tend to have low start-up costs but higher running costs, thus tending to drive the real-time price higher for loads that did not lock in prices day ahead.

The total effect of the PJM or New York approach is to encourage, but not force, parties to bid in or schedule in the day-ahead market, and to allow parties to use the real-time market as much as their commercial needs dictate. There are no penalties, but the ISO has the resources it needs to maintain reliability. In other words, maintaining reliability does not have to come at the expense of restricting access to the ISO's real-time spot market.

The key to avoiding artificial penalties is consistent pricing. If prices in each market reflect the true system marginal costs, then the incentives to use one over the other would reflect the true cost. There would be no need to be concerned about over or under using any market option.

Moreover, the Commission should recognize that artificial penalties on "underscheduling" can give rise to other bidding strategies by market participants that could make the situation much worse, not better, next summer. In particular, market participants with large FTR positions on transmission interfaces that are unconstrained in real-time could use such penalties to extract congestion charges from loads forced to schedule imports in the day-ahead market. Such cornering in the day-ahead market would be possible with mandatory scheduling requirements, but unsuccessful if customers could just turn to the real-time market as an alternative.

In sum, the Commission should reject the California restrictions on economic, least-cost dispatch for energy and ancillary services and refrain from imposing further restrictions or penalties on those who use the ISO's real-time market. The real-time market should be allowed to become an open, efficient spot market available to all market participants. To the extent that the ISO tends to have insufficient resources

available to meet real-time loads, it should offer a unit commitment service to obtain those resources without restricting market choice.

2. *An ISO should be allowed to operate integrated short-run forward markets for energy and transmission.*

Currently, the ISO is prohibited from operating integrated day-ahead forward markets for energy, even though it is charged with operating forward markets for transmission. However, the markets for energy and transmission cannot be separated without creating serious coordination problems that lead to inconsistent pricing and gaming between the markets. These inconsistencies can also lead to infeasible schedules that are accepted in the forward market but which force the ISO to redispatch in real time.

ISO-operated day-ahead and hour-ahead markets can provide useful options to market participants, allowing them to lock in energy and transmission (congestion) prices in advance of real-time. They also provide a mechanism for parties to exchange their transmission rights; that is, to settle their existing transmission rights and gain new entitlements that match their scheduled transactions.

The Commission should direct the ISO to operate open, bid-based integrated forward markets. These markets would allow parties to buy and sell energy, ancillary services and transmission. The integrated markets could come about by consolidating the ISO and PX or by allowing the ISO to acquire and/or operate the related day-ahead and hour-ahead functions of the PX and to integrate these energy markets with the ISO's transmission markets. The combined markets could then be fully coordinated under a consistent set of bidding, market-clearing and pricing rules.

Just as rules preventing the ISO from achieving an economic (least-cost) dispatch should be removed from the real-time market, so too should rules preventing the ISO from clearing the forward markets and relieving congestion at the lowest cost be removed. Currently, the ISO is prevented by the so-called "market separation rule" from relieving congestion at the lowest cost in its day-ahead and real-time markets. These rules should be eliminated.

The premise of these rules is flawed. The rules state that participants should be required to balance their schedules to match generation and loads rather than providing open access to the balancing service. With an open balancing market provided by an ISO or RTO, these impediments to trading are not justified. There is sometimes an argument that the ISO should not be allowed to effect "trades" between unwilling participants, but the argument has always been backwards. This California rule has historically prevented the ISO from effecting "trades" between parties who would be willing to have the ISO coordinate such trades. Hence, rather than forcing parties to accept an ISO result, the rule prevents parties from getting access to the ISO's market coordination. The "trades" referred to would occur if the ISO used the most cost-effective incremental bid from one party and the most cost-effective decremental bid from another party in order to relieve a transmission constraint in the most cost-effective manner. Thus, the market separation rule as applied to the ISO's forward markets is just another example of preventing least-cost dispatch, or in this case, least-cost redispatch to relieve congestion.

Importantly in the current context, by making market participants balance their schedules and manage congestion using only congestion adjustment bids, the market separation principle is likely to require both more capacity for use by the ISO, in the form of regulation, and more capacity to be held back by market participants to manage congestion (to support adjustment bids). The market separation doctrine may therefore have been an important contributor to the capacity shortages that have periodically affected the California and West Coast markets during the past year. The market separation doctrine and the other inefficiencies built into the California market design were built on an implicit premise that there would always be lots of excess capacity to accommodate that inefficiency. It should be clear after last summer that neither California nor the WSCC can afford that level of market inefficiency.

Moreover, in the long run, the market separation rule may intensify market concentration and facilitate the ability of dominant scheduling coordinators to exercise market power. By forcing the ISO to deal with each scheduling coordinator individually, rather than pooling the adjustment bids submitted by all scheduling coordinators, the rule favors the largest schedule coordinators with the largest and most diverse portfolio of adjustment bids. Over time, the natural advantages will concentrate the market, forcing the ISO to deal with the most dominant schedule coordinator(s) while leaving smaller entities at their mercy. Given its concerns about market power, the Commission should direct the ISO to eliminate the market separation rule and its companion requirement that parties submit only balanced schedules.²⁹

Once the ISO is free to use all the bids to achieve a least-cost redispatch to relieve congestion, it can then use that redispatch to deal with all of the congestion in each market. Currently, the California ISO does not solve all congestion in its forward markets, because the market separation rules make it very difficult to do so. Thus, in its forward markets, the ISO uses adjustment bids to relieve only the congestion between existing zones (inter-zonal congestion) but does not attempt to resolve congestion within each zone (intra-zonal congestion). The result is that the ISO is forced to approve schedules in the forward market that it knows are infeasible and that will require it to solve through redispatch in the real-time market. (Note that balanced schedule requirements and restrictions on access to the real-time market would only exacerbate the ISO's real-time redispatch problem.) Further, the ISO's inability to address intra-zonal congestion in the forward markets means that the prices in those forward markets do not reflect the marginal cost of all of the congestion. The price signals are misleading. At best, they tend to encourage scheduling parties to overschedule the grid in the forward market, causing further intra-zonal congestion that cannot be solved until real time. At worst, they create opportunities for artificially creating congestion that the scheduling parties must be paid to relieve. The Commission should therefore direct the ISO to use the voluntary bids submitted in each market to relieve all congestion in each market, and to do so at the lowest as-bid cost.

If the ISO is to be successful in dealing with congestion in the day-ahead forward market, the model it uses for evaluating congestion must reflect the full complexity of the

²⁹ If our understanding of the CAISO software is correct, the elimination of this restriction would be easy to implement, as the software relaxes the balanced schedule constraints in the solution process.

grid. Recent “reform” proposals from the ISO and urged by some stakeholders would make this impossible. Instead, they would require the ISO to create and use a simplified “commercial” model of the grid that ignores important constraints. If the ISO used this unrealistic model in the real-time market it could endanger reliability; if it used the model in the forward market, it would guarantee that schedules approved in the forward market could still be infeasible because important constraints had been ignored. There is no escaping the realities of the grid. The ISO should be allowed (required) to use realistic models of the grid when evaluating congestion. Whatever level of modeling accuracy is required to maintain reliability in real time should be applied in the forward markets to ensure feasible schedules and consistent pricing.

3. *An ISO should use locational marginal pricing to price and settle all purchases and sales of energy in its forward and real-time markets and to define comparable congestion (transmission usage) charges for bilateral transactions between locations.*

The Commission will recall that several months before the California ISO and the Commission became preoccupied with the high prices produced by the California market, the Commission had already found the ISO’s congestion management system to be “fundamentally flawed” and in need of comprehensive reform. Because the congestion management system implicates many other aspects of the overall market design, the ISO management’s process for congestion management reform eventually grew into a comprehensive market redesign process. However, the most fundamental reform needed by the market design and the congestion management process is to get the prices right. The California zonal system is fundamentally flawed because it cannot get the prices right. It is time for the California market to solve this fundamental problem by moving to nodal locational marginal pricing.

The Commission appears to have concluded that the ISO can satisfy the need for comprehensive reform of its congestion management system by simply creating a few more zones. The ISO Staff has so far steadfastly maintained that with these new zones, all will be well. It promises to model the system periodically to make sure that its zones remain sufficient and to revise its zones in the future when and if needed. This is the same argument used since the beginning of restructuring in California. It has been an illusion and a license to maintain a fundamentally flawed concept.

The zonal experiment has failed and it must be replaced. It is the source of persistent gaming, infeasible schedules, and poor locational signals. It encourages overscheduling of constrained transmission, fosters market power and muffles the price signals that loads need to respond to high prices. It requires side payments to provide an economic incentive for generators to follow redispatch instructions, but the requirement to make these payments creates gaming opportunities that have been exploited by some generators. It requires constant ISO intervention to offset the poor price signals while forcing the ISO to become increasingly entrenched in centralized resource planning and acquisition schemes. Even when it is not struggling with inadequate supplies, the ISO must still struggle with operating the system, because getting the prices wrong ensures that generators have incentives that will be inconsistent with what the ISO needs them to do to maintain reliability. The experiment has failed, and it is time to end it.

The ISO's most recent congestion management reform proposals anticipate that there might be at least eight new zones (now called "local pricing areas" or "local reliability areas"). The creation of these eight new zones is a positive step, but it should be understood that it will only mitigate, not eliminate, California's recurrent problems with infeasible schedules and intra-zonal congestion. It is important to recognize, moreover, that the creation of eight new zones will likely greatly exacerbate the problems associated with the current form of the adjustment bid based congestion management system. As a result, the ISO Staff has maintained throughout the congestion reform process that it must have additional mechanisms to relieve the new "inter-zonal" congestion between these new zones and the existing zones.

To address this need, the ISO Staff proposed (but the ISO Board rejected) a new two-day-ahead process to select resources in each new LRA. These resources would be required to schedule in the day-ahead market enough energy to ensure that all expected intra-zonal congestion within, and any inter-zonal congestion into each LRA would be relieved. Apparently, the Staff had concluded that reliance on the adjustment bids in the day-ahead market would not be sufficient to relieve all of the congestion, because the market separation rule would effectively limit the number of bids that the ISO could use to relieve constraints at each inter-zonal interface. Thus, an accumulation of flawed rules and their perverse interactions have made the market virtually unmanageable using market processes, forcing the ISO to rely increasingly on command and control measures. More seriously for consumers in the short-run, the combination of eight additional zones and the current adjustment bid congestion management system could pull additional capacity out of the day-ahead markets, increasing the capacity shortage, at a time when there is no excess capacity to subsidize this inefficiency. Retention of the adjustment bid congestion management system and balanced schedule requirements across additional zonal interfaces could give rise to market conditions that would make the outcomes in the California electricity market during the summer of 2000 look good in comparison.

The Commission should not rely on the ISO's assurances that just a few more zones will capture all of the commercially significant congestion within and into California. Such claims have been made before and been proven incorrect. Experience everywhere is that congestion patterns are not stable, and new constraints will arise frequently. Studies of PJM are particularly instructive about the general phenomenon. Last year's constraints are poor indicators of the constraints that are binding this year.³⁰ And this year's constraints will prove equally poor indicators of the constraints that will be binding next year. As new generation is added at various locations, the congestion patterns will change, and when fuel prices and hydro conditions change, the pattern will change yet again. Trying to predict and lock in the commercially significant constraints, and to define pricing zones around these predictions, is a recipe for getting the prices wrong.

³⁰ See, Andy Ott, "Can Flowgates Really Work? An Analysis of Transmission Congestion in the PJM Market from April 1, 1998 to April 30, 2000," September, 15, 2000. A soon to be published extension of the Ott study of the PJM market shows that during 2000, there have been over 130 new binding constraints that have not been binding in previous years.

At a minimum, the Commission should direct the ISO to determine and post nodal prices using locational marginal pricing and to use those LMP prices to settle with all generators. The LMP prices should be used in both the forward and real-time markets operated by the ISO. This will eliminate the need for constrained-on and constrained-off payments for redispatched generations, thus eliminating the “constrained-on gaming” and “constrained-off gaming” that have plagued the ISO congestion management markets. LMP pricing will ensure that generators are paid the market-clearing price at their location without having to withhold capacity or guess the market-clearing price. The strategy of drawing the generators into accepting less than the market-clearing price has not worked, and California can’t afford the inefficiency any longer. Efficient nodal pricing will send the right price signals for short-run operations and will reinforce what the ISO is trying to do to manage congestion and maintain reliability. The efficient prices will also provide the right signals for long-run investments, obviating the need for ISO restrictions on new generator interconnections. Getting these prices right is the foundation for relying on market-based decisions.

Appropriately metered loads should also have access to the nodal prices at their locations. Giving the right price signals to these loads will enhance the effectiveness of demand response programs, which in turn will provide more efficient prices and help mitigate market power.

For loads without appropriate interval meters, monthly averaging will still be a necessity, and the value of mapping individual loads to individual pricing buses may be limited. However, the prices charged to these loads should be determined as the weighted average of the nodal prices in their pricing area. The choice of each “pricing area” is a matter of retail rate design. At the highest level of aggregation, the area may be the traditional utility service area. Alternatively, the State can be guided by the ISO’s studies, such as those used recently to define new local pricing areas. How these areas are defined, and how often, can be determined by the respective state rate-making authorities working with the ISO.

4. *An ISO should offer tradable point-to-point financial transmission rights that allow market participants to hedge the locational differences in energy prices.*

Once market participants are exposed to locational price differences and point-to-point congestion charges, they will need tradable transmission rights that allow them to hedge these locational differences and congestion charges in order to obtain *ex ante* price certainty for their transactions. Point-to-point FTRs will be necessary to support a nodal LMP system.

The current FTRs are not point-to-point but are rather defined across specific inter-zonal interfaces. With the addition of at least eight more zones (LRAs) within California, the existing FTRs would have become increasingly unworkable. The existing FTRs are essentially a form of financial flowgate rights, and the addition of new zones would force market participants to struggle with the need to obtain multiple flowgate rights for each transaction, given the loops within and around the California grid. The ISO and stakeholders were only beginning to recognize the problems of changing

distribution factors last Spring when they were overwhelmed by responding to the high price conditions. No clear solution to this problem has been proposed.

The basic problem is that market participants will not be able to predict the power transfer distribution factors that will apply when the ISO solves congestion in real time. This means that participants will not know in advance how the flows of their planned transactions will disperse across each flowgate (inter-zonal interface) and hence will not know how many flowgate rights to acquire at each flowgate to hedge any given transaction. Essentially, this means that there can be no complete long-term transmission rights in the California market. If the ISO continues its current course, flowgate rights will become, at best, illiquid partial hedges, unless the stakeholders convince the ISO to pretend the rights are full hedges and agree to subsidize the difference. If this happens, the price signals will continue to be wrong, as scheduling parties are encouraged to schedule transactions that are infeasible, because their "full" hedges will have been subsidized against the redispatch costs that their transactions impose on the ISO and other market participants.

The Commission should direct the ISO to redefine its FTRs as point-to-point financial transmission rights. Point-to-point FTRs would remain viable no matter where or how many constraints occur and whether or not "new" constraints arise between the points. They would remain viable no matter how the PTDFs changed.³¹ Hence, participants could obtain effective hedges on a long-term basis, without fear that their FTRs would leave them unhedged when grid conditions changed.

Moreover, the Commission should direct the ISO to define FTRs in the form of obligations as well as options and to formulate an auction format in which generators can offer such counter-flow FTR obligations, creating a forward counter-flow market for congestion management such as that currently found in PJM (through its monthly auction) and New York (through both its monthly reconfiguration auction and longer-term auctions). This would be consistent with the Commission's goal of eliminating barriers to efficient forward contracting.

5. *An ISO should simultaneously optimize its ancillary service markets and energy markets.*

Experience in New England and California have now amply demonstrated that the short-run markets for regulation and operating reserves must be fully coordinated with the short-run markets for energy. Ideally, these markets should be simultaneously optimized and their pricing rules made consistent. This will ensure that generators receive efficient market-clearing prices in each market and are neither forced nor

³¹ Maintaining each FTR's full hedging ability may require that when there are transmission outages, full FTR funding be maintained even if congestion rentals for a given settlement period fall short. In such cases, the rules could require that FTR funding be reduced *pro rata*, or they could require that surplus rentals from other settlement periods be carried over to fund deficit rentals in other periods. Ideally, transmission owners could be provided a performance incentive for efficient maintenance, while holding them financially responsible for making up any revenue shortfalls in funding the FTRs when lines are down.

encouraged to guess at which market would be the more profitable venue. By optimizing these markets simultaneously, the ISO will ensure that the mix of resources chosen for energy and ancillary services will be the lowest overall cost, given the available bids. By using consistent pricing, generators will be assured that their cost recovery and potential for profits will not be adversely affected whether they are chosen to provide energy, provide regulation or spin, or withheld to provide reserves. If generators are paid consistent market-clearing prices in each market, they will not have to guess the market price or risk bidding mistakes. Instead, generators will have an incentive to bid their marginal costs.

Simultaneous optimization and the associated price cascading are not complicated in principle and can be made to work reasonably well in practice to eliminate perverse bidding and scheduling incentives. Simultaneous optimization and price cascading (and the rational prices they would give rise to) would also permit the CAISO to implement a two settlement system for ancillary services that would avoid paying generators once for reserves in forward markets and again for energy in real-time markets.

6. *The ISO should collaborate in rapidly expanding the capability to include demand side response for energy and ancillary services.*

The least controversial reform of market design would be to implement all the changes needed to allow for demand side response in the face of higher prices. This should include changes both in the wholesale market mechanisms to allow for demand side bids in the day-ahead markets and, for properly metered and controllable loads, in the real-time market. In addition, retail rate designs under the control of the California Public Utilities Commission (CPUC) should be such that customers who choose can see the wholesale price and respond to higher prices by reducing their demands. Prices for usage should be based on the market-clearing level. Retail prices in California that are below the cost of fuel, subsidize electricity consumption in California and raise both electricity and gas prices throughout the WSCC. Any rebates should be in terms of reduced connection costs or in some other manner to break the link between average and marginal rates.

Slightly more controversial, but equally important, would be to introduce the same type of demand response for reserves and ancillary services. Not all reserves are equally valuable, and there has always been some tradeoff between reliability and cost. The traditional procedures that embodied this fact have been replaced by rigid requirements in the new market that have the effect of forcing prices to very high levels, much higher than the reserves or the energy are really worth. The Commission has already addressed this issue in principle in the context of recent proceedings regarding the Northeast ISOs.³² The same arguments apply to California. The reality is that on its worst high load day, the CAISO is purchasing enough capacity to meet load, provide a large amount of regulating capacity, maintain sufficient 10-minute reserves to cover the

³² For ISO New England, see for example, Federal Energy Regulatory Commission, "Order Conditionally Approving Congestion Management and Multi-Settlement Systems," Docket No. EL00-62-000, June 28, 2000.

largest single generator outage contingency, and maintain what appears to be another couple thousand mega-watts of extra reserves. The couple of thousand mega-watts of extra reserves have value and contribute to reliability, but they may not have sufficient value to treat their acquisition as a requirement at any cost in potential shortage situations. The CAISO should eliminate absolute reserve requirements in excess of the largest contingency and implement a demand curve, reflecting reserve shortages in day-ahead and real-time prices.

TRANSITION RULES

Pointing to the preferred market design is necessary. A Commission direction to the CAISO to produce a filing that filled in the details would be essential if such a design is to be embraced before events force the road to reform to reverse the course towards greater reliance on markets in a return to cost-of-service regulation, or worse. Furthermore, it is essential to have some framework to evaluate any transition steps, if nothing else to make sure that the transition is headed somewhere that we want to go.

However, knowing the eventual market design goal is not enough. As the Commission has recognized, there is an immediate need for action now to mitigate the most serious impacts in the California market.

Furthermore, it is no longer possible to work with a clean slate. The experience of the California Summer of 2000 was too searing. The political process is now well engaged and there are many proposals for reform that work in opposition to each other or move away from the long-term goal. Faced with this reality, the transition must be considered in terms of the degree to which it meets various objectives.

One proffered objective is ensuring the "protection of consumers." Average prices have been judged to be "too high." The immediate steps going forward seek to guarantee reliable service at an average price to the final consumer that is deemed to be low enough, as well as "just and reasonable." Any transition proposal must address the degree to which it envisions, or even seriously risks, a repeat of Summer 2000.

However, more is required if there is any hope of making the immediate steps a real transition, rather than an *ad hoc* implementation of endless experimental regulation. The transition rules must incorporate as much of the critical market design features as possible along with an internally consistent method of moving from the old to the new. Hence, any transition framework should include explicit consideration of how well it is likely to work in a market setting and how it will ensure a transition to an efficient, workable market.

Consistent with the Commission's policy orientation towards a market approach, transition rules should be biased towards reliance on voluntary commercial transactions. The Commission can mandate market rules, structure and incentives. But it must rely on the incentives for performance. This creates problems given the evolution of the California market. The initial decisions peculiar to the California restructuring have produced new ownership patterns and contractual obligations. These embody public policy commitments made in restructuring that may have been ill conceived, but nonetheless have created obligations in place.

Immediate consumer protection is a debate about how to ensure just and reasonable average prices. When prices are high, there are typically two competing explanations. One is the exercise of traditional market power, the other is shortage that produces high prices through simple competition when demand exceeds supply at lower prices. Untangling the mess in California to distinguish the market power effects from the scarcity effects is difficult. Whatever the source of the high prices, there is the same general flow of the money away from customers and towards suppliers. At the margin, we can have different views about the true opportunity cost, but on average some part of the high prices is a rent transfer from customers to suppliers of electricity, suppliers of natural gas, holders of environmental permits, and so on.

By contrast, markets and their magic are all about what happens on the margin. Transition to a market requires that the market design allow for proper signals for marginal decisions and investments. The desired remedies of greater demand responsiveness, new generation entry and greater operational efficiency all build on the idea that the market participants face incentives that reflect the true opportunity costs at the margin.

Immediate adoption of a number of the key elements of the long-term market design would help in the transition. For example, consolidation of the responsibility for short-term market coordination and reliability management under the CAISO would allow other reforms to proceed. Introduction of better mechanisms for demand side bidding on the energy market would incorporate a reform that all agree is necessary to operate a market and moderate price spikes. Introduction of a demand curve for reserves would better reflect the reality of how electric systems have always been operated but translating that into the context of market bidding and pricing. Allowing the CAISO to perform an economic dispatch that simultaneously optimizes the energy and ancillary reserve markets would remove some of the perverse incentives that lead to pricing anomalies and probably reduce the need for capacity devoted to regulation and supporting adjustment bids. All this could and should be done expeditiously, and need not take a long time.

These changes could only help, would not cost much, and would work both in the short run and the long run. The Commission should not hesitate to direct these changes. However, it is uncertain what their short-term and long-term impacts on the wholesale price level would be, particularly given the additional uncertainties involving gas prices, demand and hydro energy supply. Other remedies are targeted directly at lower prices. These other remedies that might be part of a transition are much more problematic. Here we consider the impacts of taxation, price caps, bid caps, and forward contracts.

Taxation

To the extent that the problem in California is perceived to be that small customers are paying market prices, and market prices are too high, any source of money could be used to reduce the financial impact of the customers' bills even though the customers continue to consume the electricity. An emphasis on taxation to ease the transition would put the focus on the money and not on distortions of the market rules. Hence, the use of tax dollars to reduce the impact of higher market prices could have a significant impact.

Paying taxes is not voluntary, but the burden of the increased taxation would be relatively less when viewed as a part of total income rather than of electricity consumption. Other things being equal, the distorting effects of broadly based taxes are generally viewed as less than those that are more concentrated. Hence, taxing everyone is better than taxing only one sector of the industry. Furthermore, the transfer from taxpayers to electricity consumers would probably not be neutral. The incidence of taxes is not likely to be the same as the incidence of electricity consumption. The payments to consumers might be further limited to only those small residential customers and on a basis that is not related too closely to individual electricity consumption decisions.

There is some precedent in California for considering use of general tax revenues to support the transition in electricity restructuring. At a minimum, this would be a way for the state legislature to address directly some of the problems created by the defects in the original restructuring law and policy. Furthermore, to the extent that such revenues are available, this would be an approach to addressing the overhang of costs from high prices seen in the summer of 2000.

On the other hand, if the source of the problem is high costs for gas and emission allowances and capacity shortages, subsidizing electricity consumption in California could largely serve to further elevate gas and allowance prices, while elevating electricity prices throughout the WSCC.

Price Caps

The transition remedy of price caps does not meet the second objective because it does not allow for this operation of the market at the margin. Setting aside the many difficulties of defining, implementing and enforcing price caps, if a price cap can be enforced and is low enough, it will mitigate the average payments by consumers and reduce the flow of money to the suppliers. But the price cap will exacerbate all the other problems that require incentives at the margin. In the end, either this is a policy that requires load curtailment and reduced reliability or, as we have seen, this will drive the CAISO to find mechanisms where it enters the market to make arrangements for supplies that cannot be obtained under the incentives of the price cap. At best, this will put the CAISO in the role of being the vertically integrated supplier of more and more services. At worst, it will undermine the intent and effect of the price cap.

Price caps might be useful as temporary circuit breaker protection to keep peak prices from reaching very high levels, but not as a way of keeping average prices low. Witness the experience of Summer 2000 with falling price caps accompanying rising average prices. In effect a price cap attempts to reduce the flow of money from consumers to suppliers. It seems simple, but this is deceptive. Price caps have a long and unhappy history. The history says that either of two things can happen. One, we eventually abandon the price cap, but only after enduring substantial costs that defeat its main purpose and make the eventual transition to the market even more expensive and more difficult. Or, the regulatory system accommodates more and more ways to work around the price cap to create all the worst features of cost-of-service regulation going forward. The U. S. experience with the former path is best illustrated by oil and natural gas markets in the 1970-1980s. The unhappy experience with the latter path can be seen

in electricity markets in the 1980-1990s, which prompted electricity restructuring in the first place. Going back is not the way forward.

Bid Caps

A bid cap is not the same thing as a price cap. If the cause of market turmoil and high prices is the exercise of traditional market power, then it must be that capacity is being withheld from actual use to supply energy or reserves in the final dispatch. Note that this is not the same as asking for and receiving a high price for capacity that is eventually made available in the final dispatch, i.e. being paid the market-clearing price. If the generation capacity is actually used, high prices must be driven by shortage. Traditional market power entails ultimate withholding.

The bid cap approach would be to identify those suppliers that are withholding in this way and impose on these suppliers an obligation to offer most or all of their capacity into the market at no more than a bid cap.³³ This is intended to remove the ability to withhold, but not require any other changes in the market. In particular, if the true market-clearing price is above the bid cap, then the supplier would receive the market price. If the market-clearing price were below the bid, then the supply would not be called because it would not be needed.

By design, a bid cap differs from a price cap in order to make it compatible with a market and market-clearing price. Hence, when traditional market power can be identified, the bid cap provides a targeted means for mitigating market power. And this mitigation procedure would be compatible with the rest of the market design during the transition. Even bid caps can require difficult evaluations of why generation is not available in the market, was a particular outage avoidable, was the unit brought back as quickly as possible, and so on. Hence if the market power were likely to persist in the long-run divestiture might be preferable to continued reliance on bids caps.

Of course, compliance with the bid cap is not voluntary. The justification for the deviation from the principle of voluntary participation would be a finding of market power. Presumably the restructuring rules were never intended nor could be construed as providing a foundation for protecting the exercise of market power. Furthermore, to the extent that the bid cap is not set too low, the bid cap compels no more than that the existing generator surrender its market power, not that it surrender the normal profits it would earn under the competitive market assumption. The bid cap is selective, and does not apply to new entrants or those who do not have market power.

Bid caps could be an important part of the transition rules. They would not be easy to administer, but they would be much easier to administer than would price caps. However, the very attraction of bid caps means that the effect is limited to mitigating traditional market power. By contrast, if the real cause of high prices is high costs and capacity shortage, where demand outruns supply, then bid caps would not significantly reduce the market-clearing price. The market price would still be set at a high level by some entity lacking market power and not subject to the bid caps. Bid caps would be

³³ The design of a bid cap is easiest in the case of thermal plants. The question of hydro suppliers that exercise market power might require some other mechanism.

effective in mitigating traditional market power; they would not be effective in lowering prices in a shortage condition.

Forward Contracts

An alternative transition tool that has been prominent in other electricity restructuring efforts has been the vesting contract. The basic idea would have been simple had it been applied in the divestiture process. If utilities sold generating plants, the sale would include a contract for the output of the plant at a price deemed "just and reasonable" over the life of the contract, a period set to cover the transition to the full market operation. These long-term forward contracts would provide a dual beneficial effect. First, they would help reduce or remove incentives to exercise market power in spot markets. Second, they would provide an effective hedge for customers to protect them from higher spot market prices.

The impact on market power would arise because the forward contract transfers the economic interest in the output of a generating facility from the generator to the customers. The generator continues to control production, but now the principal incentive would be to maximize the production from the plant whenever the market-clearing price exceeded costs, just the right incentive to support the competitive market.³⁴

The impact on customers' average prices through such forward contracts is obvious. The effect would be to recycle the money on average but not on the margin. Market-clearing prices at the margin might be high, but long-term forward contracts for a significant fraction of total load could serve the purpose of mitigating the financial impact of price increases (and decreases) without giving rise to the perverse incentives of price caps. If such contracts were in place, at least for customers deemed small enough to need protection from the transition market, it could be possible to allow for a market design that provides the right incentives at the margin and allows for a self-enforcing exit from the transition stage. This would still not be trivial, however, for if the problem is in part high costs and capacity shortages it would be important to encourage consumers to reduce consumption, and thus important that consumers see the full marginal price for incremental consumption, rather than some average price that would subsidize continued consumption.

The Commission has recommended encouraging (perhaps requiring) utilities to enter into long-term forward contracts. These forward contracts would be quite different from the vesting contracts described above. In particular, the vesting contracts would have been set at the time of sale of the generation with an energy price then determined to be reasonable. The energy pricing would have been mandatory and the implicit value of the vesting contracts would have been reflected in the sale price of the generating facilities. By contrast, entering into forward contracts after the sale of the facilities is a different matter.

³⁴ Frank A. Wolak, "An Empirical Analysis of the Impact of Hedge Contracts on Bidding Behavior in a Competitive Electricity Market." *International Economic Journal*, 14(2), pp. 1-40. (available from <http://www.stanford.edu/~wolak>) See also, Richard Green, "Britain's Unregulated Electricity Pool," in M. Einhorn (ed.) *From Regulation to Competition: New Frontiers in Electricity Markets*, Kluwer, Boston, 1994, pp. 73-95.

One proposal suggests emulating a vesting contract by having a contract form, duration and price set in advance and approved in advance by regulators.³⁵ This suggestion would address the concern of utilities that such long-term contracts be deemed prudent so that the ultimate costs can be recovered in regulated rates charged to customers. While the prudence issue is important, it does not speak to the more difficult question of why suppliers would be prepared to sign such contracts. If the price is set low, it might appeal to regulators, but there is no reason that suppliers should agree to sign such contracts.

If generators did sign such contracts, that might be helpful. However, this could be viewed simply as evidence that the price was high enough to capture by contract the high prices that otherwise would be expected in the spot market. As a means of lowering costs to customers, this would not seem to accomplish the stated objective. It might make prices lower than Summer 2000, but it could also make them higher, even much higher, than the prices of Summer 1999, and it could make them higher than spot prices turn out to be for Summer 2001. On balance, customers might not be better off, and the utilities may be justified in their worries about the *ex post* prudence review.

If the regulatory pre-approved price is set low enough, suppliers may not sign voluntarily. What then? Inevitably there would be calls for using the power of regulation to force generators to sign the contracts. This will present many difficulties. On its face, this approach would abandon the notion of voluntary participation in economic choices. What would be the justification for such compulsion? The justification could not be traditional market power, which could be handled through bid caps. If the problem of high prices arises from high costs and capacity shortage, then use of such mandatory forward contracts would be a rejection of a market approach. In effect, we would be reversing the decisions of restructuring to date and abrogating the deals that had been made in good faith.

At a minimum, it should be recognized that tracking down the deals that have been made would involve a complicated contract chain. Many of the owners of generating plants have already sold some or all of their power forward. Presumably a new mandated obligation to sell it forward again would not be applied to these generators. Would this then mean we would have to trace the ultimate beneficiaries of the forward contracts? The contract chain of further transfers of rights to the hedges could lead to customers already hedged, so we would have to separate these from others. This would require distinctions among the beneficiaries of forward contracts. How would these judgments be made? Without voluntary participation of the parties, how could we untangle the complex contracts and ownership provisions that have evolved? Simply making the pre-approved forward contracts mandatory would not be easy or quick.

One alternative to preserve voluntary participation might be to combine the taxation and forward contract approaches. Suppose there were a class of customers, such as residential and small commercial customers, deemed to be the responsibility of the

³⁵ Remarks of Commissioner William Massey (attributed to Professor Frank Wolak of the California Market Surveillance Committee) Energy Bar Association Meeting, Washington, DC, November 17, 2000.

utilities to arrange low cost supplies. The pre-approved forward contract would be defined. This would be defined as a "contract for difference" relative to the locational market-clearing price at the point of load defined by the utility. The utility would decide on the amount of energy to hedge under such contracts. Given the amount, the utility would conduct an auction for the payment that would be required for suppliers to sign the contract.³⁶ The source of funds for the signing bonus would be from general taxation revenues. Given a decision to have such forward contracts, this would be a means that would allow low direct average prices, market-clearing prices for incremental energy, voluntary participation by the suppliers, and a transition that would be both market oriented and consistent with the move to a more normal market operation. If tax revenues were to be employed, this should minimize the immediate payments required.

This is a way to have forward contracts. But the merits of any forward contracting at this time are far from obvious.³⁷ Simply put, in a seller's market, pushing buyers to sign long-term contracts runs a greater risk of paying too much than paying to little and is as likely to create new stranded costs as it is to benefit consumers. California missed the window of opportunity of having vesting contracts.³⁸ The appeal of that foregone opportunity should not cloud our judgment about the realistic opportunities before us.

A Comprehensive Package

Whatever approach is taken to the transition rules, the Commission should continue in the spirit set out in its proposals to provide a comprehensive package for reform. Some of the initiatives, such as improved demand side response, might be desirable no matter what happens. But much of what needs to be done is interdependent.

For example, the beneficial effect of bid caps in mitigating the price impacts of traditional market power might be small if there is still a shortage situation, and a material price impact would depend in large part on the success in developing a demand curve for energy and reserves. In the extreme, without any demand response, bid caps would do little to lower prices in shortage situations.

Similarly, the ability to get a response from suppliers in signing long-term forward contracts will depend in part on how the other parts of the reform package may work. The alternative to some form of negotiated settlement on contracts might be worse for everyone if the effect is simply to ensure the reintroduction of cost of service regulation. At the same time, many or most suppliers might be more willing to enter into reasonable contracts if the rest of the market reforms are included in the package. But

³⁶ The echoes of the Biennial Resource Plan Update (BRPU) process are noted. Presumably we could benefit from that unhappy experience with complicated bidding schemes by keeping the form of the forward contracts as simple as possible and reducing the bids to the single dimension of the amount required to sign the contract.

³⁷ Scott M. Harvey and William W. Hogan, "California Electricity Prices and Forward Market Hedging," October 17, 2000. (available at ksgwww.harvard.edu/people/whogan).

³⁸ Of course, even if we had replayed history, acquiring vesting contracts at fix low prices might have reduced generator proceeds materially and raised stranded cost recovery requirements.

these suppliers may be unwilling to cooperate if the worst aspects of the market design remain in place and long-term contracts are seen only as a confiscation of assets.

The approval of long-term contracts to preempt *ex post* prudence exposure for what might be relatively high prices would seem to be essential, else the utilities would face the prospect of bankruptcy later to provide others with relief now. Ultimately, there would have to be some resolution that included both the existing overhang of the high costs from the summer of 2000 as well as the high cost that we see going forward.

The sharp change in market conditions presents a major policy dilemma. Looking ahead, the utilities have an interest in advance guarantees of prudence for forward contracts. Otherwise they would face the risk of *ex post* prudence reviews that would apply perfect hindsight to set prices at the "lower of cost or market," reflecting a counterproductive asymmetry in regulation that produced large stranded asset accounts. At the same time, we look today at the existing electricity suppliers who purchased generating assets at costs once seen as high but that now seem low relative to the market. The political pressure is to apply a similarly faulty asymmetric regulation to these suppliers. The dilemma is in finding a rationale for these conflicting tendencies. Any principled argument that applies to one case should apply to other.

Whatever the merits of the argument, the legal situation may be controlling. If the Commission finds that there has been an exercise of traditional market power, then it would be appropriate to determine that the current prices are not just and reasonable. By contrast, if the high prices reflect only scarcity and higher real costs, current prices could be determined to be just and reasonable. Furthermore, if scarcity is the principal explanation of high prices, it would be especially important that the high prices be seen and passed through at the margin in order to provide the right signals for the market. Any reductions in average costs in California should be restricted to infra-marginal transfers that would avoid exacerbating problems throughout the WSCC.

If the legal finding comes down to a conclusion that prices are not just and reasonable, then the Commission may be constrained to a return to cost-of-service regulation if some better solution cannot be fashioned. This finding would change expectations from a continuation of the *status quo* to an anticipation of a prospective regime that would be worse than a comprehensive settlement at this stage. In this environment, a comprehensive package of market reforms, expanded use of bid caps, and negotiated forward contracts might be in the interest of everyone, both customers and suppliers, as preferred to a return to cost of service regulation.

SUMMARY

The Commission has taken a major step in its proposals for California. Its own analysis points in the direction of fundamental reforms in market design. However, this same analysis and the experience of the failed process in California dictate that the Commission travel much further, much faster. The Commission should clarify the responsibility of the CAISO in operating the integrated reliability rules and short-term markets that will be essential for successful operation of an electricity market. The Commission should give quite specific guidance about the design of the future California

market along the lines that have worked elsewhere and that reinforce the requirements of Order 2000. At the same time, the Commission should reconsider its use of the soft price cap or any movement to pay-as-bid auctions. The better policy mix for mitigating traditional market power would be a combination of bid caps and forward contracts, but only under conditions where these are part of a comprehensive reform and not simply another short-term fix that creates long-term costs. None of this will be easy, but procrastination or another round of failed reforms in California would be worse.

STATEMENT OF PROFESSOR PAUL L. JOSKOW¹
BEFORE THE COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

JUNE 13, 2001

Thank you for giving me the opportunity to appear here today to discuss economic issues associated with the restructuring of U.S. energy industries. My statement will focus on the electricity sector. I have been working on the challenges associated with introducing competition into the U.S. electricity industry for 20 years.² During the last ten years I have also been involved in electricity market design and performance assessment initiatives in several regions of the U.S., including California, and in several other countries.

I continue to believe that if properly implemented, wholesale and retail competition in electricity can bring real benefits to electricity consumers in the long run. I also continue to believe that creating well functioning competitive electricity markets is a very difficult challenge, that we will make mistakes along the way, and that mid-course corrections will be necessary. I am anxious to see these competition and regulatory reform initiatives succeed. However, as I look around the country at the states which have restructured and introduced wholesale and retail competition programs, it is quite clear that things are not going nearly as well as many had hoped only a couple of years

¹ Elizabeth and James Killian Professor of Economics at the Massachusetts Institute of Technology (MIT) and Director of the MIT Center for Energy and Environmental Policy Research. The views expressed here are my own and do not necessarily reflect the views of MIT or any other organizations with which I am affiliated. A CV with my educational background, affiliations and a list of my publications can be obtained at <http://web.mit.edu/pjoskow/www/>.

² My book (with Richard Schmalensee) *Markets for Power: An Analysis of Electric Utility Deregulation*, MIT Press, 1983 was my first major publication on this subject.

ago.³ We need to identify the nature of the problems, do what is necessary to fix them, and demonstrate that when electricity reform programs go bad responsible federal agencies will not abandon the states with which they worked to implement them but rather will work closely with them to find and apply solutions.

The development of competitive wholesale and retail electricity markets in the U.S. is a work in progress. The events in California and the rest of the West during the past year have, properly, attracted enormous attention and concern. This is not what California's electricity consumers, utilities, or its government officials bargained for when their innovative electricity restructuring and competition reform program was initiated in 1994. (I have attached a table of average hourly wholesale prices in California for each month from April 1998 through April 2001.) The causes of California's electricity crisis are complex, reflecting a combination of bad market design, bad regulatory decisions, unanticipated changes in basic supply and demand conditions, and supplier behavior which rationally took advantage of opportunities created by these conditions to further increase market prices.⁴ Some progress has been made in mitigating the short run and long run problems in California. However, both federal and state government officials can and should do more. The restructuring program developed and implemented in California was the outcome of a close cooperative relationship between FERC and California officials --- they called it "cooperative federalism." FERC approved California's new wholesale market institutions before they went into operation

³ Expectations were probably unrealistic rosy. However, nobody expected the kind of mess that we have seen in the last year in California and the West generally. There are aspects of these reforms that are going well. A large amount of new merchant generating capacity has been attracted to the market and is in the construction or site approval stage around the country, including in California.

⁴ My views on what happened can be found in my paper "California's Electricity Market Meltdown," June 7, 2001. A copy can be obtained by sending an email to njoskow@mit.edu.

in April 1998. Both federal and state officials enthusiastically took credit for the restructured wholesale and retail electricity markets they were creating. However as problems emerged, and especially when the market exploded during the summer of 2000, FERC was not as closely involved in solving the problems as it should have been. The cooperative relationship between Federal and California government officials quickly deteriorated into a hostile relationship that focused on finger pointing and sloganeering rather than on finding practical solutions. We need to do better.

There are a number of useful lessons to be learned from the California experience. (I have attached a list of some of the useful lessons to be learned from California as an Appendix to this statement.) These lessons are important because competitive electricity market performance problems, including market power problems, are not unique to California during the last twelve months. Numerous market performance problems became evident in California as early as the summer of 1998, long before the meltdown in 2000. There have been market performance problems requiring market reforms and mitigation measures in the new wholesale markets in New York, New England, and PJM. Moreover, large portions of the country have not yet embraced comprehensive electricity restructuring and competition programs. They are unlikely to do so unless we can convince responsible state officials and the public that we have figured out how to make electricity market institutions yield results in terms of prices and reliability that are superior to traditional industry structures and regulatory institutions.

The fact that market performance problems have occurred and mitigation measures have been necessary in all of the newly created wholesale markets should not be surprising. Electricity has unusual physical attributes that make the design of well

functioning competitive wholesale power markets a significant technical challenge. It is impossible to get it right the first time around. Electricity markets with good performance attributes do not create themselves and do not fix themselves. They must be created and reformed by people with appropriate technical expertise and experience working together and must ultimately be approved by responsible government agencies. Accordingly, mid-course corrections have almost always been necessary after competitive electricity markets first go into operation. Ongoing market reforms and regulatory “mitigation” initiatives designed to remedy serious market performance problems should be an *expected* feature of the *process* of creating efficient competitive wholesale electricity markets. Price caps, bidding rules, cost-based contracts and a variety of other mitigation mechanisms have been used or are being used in most new wholesale markets in the U.S. as short run mechanisms to protect electricity consumers from serious market imperfections until longer term fixes can be developed, introduced, and evaluated. Most other countries that have introduced competition into wholesale and retail electricity markets have confronted similar problems and relied on similar mitigation methods.

From this perspective, one should be very skeptical of the knee jerk rejection of calls for FERC to adopt price mitigation mechanisms to deal with the evident performance problems in California’s wholesale electricity market.⁵ Of course, we need

⁵ The typical knee jerk reaction is that price caps necessarily cause shortages and are always an unreasonable intrusion into “free markets.” This is simply not true if the markets at issue are characterized by significant supplier market power and the price cap is set high enough so that markets can clear at competitive prices. A properly designed price mitigation program designed to mitigate market power will both increase supplies and reduce prices in the short run. Ironically, one of the reasons for restructuring the electricity industry to rely on competitive wholesale markets was the view that cost-of-service regulation of monopoly suppliers led to excess generating capacity. Moreover, the vast bulk of the electricity generated in the U.S. continues effectively to be subject to cost-based regulation since it is produced by vertically integrated firms supplying their retail customers at regulated rates.

to be sensitive to the possibility that mitigation measures can make things worse rather than better if they are poorly designed. Of course, we must be concerned that mitigation mechanisms do not discourage new investment in generating capacity. Of course, the proper long term strategy is to fix the features of the markets and regulatory framework that are broken. But we also must be concerned about the interim costs to consumers and the economy of unmitigated market failures.

The new wholesale market that began operating in California in April 1998 is not an "unregulated" market that has been operating smoothly for decades under the guidance of the "invisible hand" of competition. Rather, it is a newly created market that most knowledgeable people expected would have at least some problems that would need to be fixed and over which FERC had and has continuing regulatory authority and responsibility. Before the new market began to operate FERC wisely created the Market Surveillance Committee (MSC) of the ISO and the Market Monitoring Committee (MMC) of the PX to monitor the performance of the California markets and to make recommendations for mitigation when serious problems emerged. Outstanding independent economists were appointed to lead each of these monitoring committees. FERC created these institutions precisely because the performance attributes of these new market institutions were very uncertain and they had been the subject of extensive criticism and controversy before they went into effect. It would have made no sense to create these monitoring organizations if FERC did not expect that it might need to make reforms and implement mitigation measures if market performance problems emerged after the market began to operate.

Accordingly, it appears that prior to 1998 FERC understood that market monitoring and at least some mitigation measures and market reforms would be necessary *after* experience was gained with California's new wholesale market institutions. At the time, I thought that the MSC would be FERC's "eyes and ears" at the center of the new market institutions and would provide information, analysis and problem solving ideas which FERC could use quickly to resolve market performance problems. The MSC and MMC did their jobs admirably. However, for some reason FERC did not make effective use of the market monitoring institutions it created or of the analysis and recommendations that they produced. It should not have taken FERC so long to evaluate the performance of California's markets when they exploded during summer 2000. FERC should have relied much more on the extensive analyses performed by the MSC at that time and worked closely with it and the ISO's Department of Market Analysis. It should also have given more serious consideration to constructive mitigation proposals put forward by the MSC and the ISO well before FERC got around to finishing its own study.⁶ Why did FERC create the MSC if it was then going to ignore it when serious unexpected problems became evident?

I was especially disappointed by FERC's response to abundant evidence that market power problems were exacerbating an already bad situation caused by rising natural gas prices, reduced imports of power, higher demand and rising prices for NOx

⁶ It is not my intention to place all of the blame on FERC for prolonging or exacerbating the crisis. There is plenty of blame to go around and policy makers have spent too much time looking for parties to blame and too little time fixing the problems. The CPUC's slow reaction to the problems, its failure to increase retail prices, the ensuing utility credit problems, and the legitimate reluctance of suppliers to supply without some assurance of getting paid certainly worsened the underlying wholesale market problems. The failure of FERC and the CPUC to find a way to work together constructively to find practical solutions in the early Fall of 2000 made the crisis much worse than necessary.

emissions permits.⁷ There is a very basic problem here. FERC does not appear to have a clear definition of market power, has not identified the empirical indicia it will use to measure the presence and extent of market power, does not routinely collect or analyze the data necessary to draw conclusions about market power, has not defined how much market power is too much market power to satisfy its obligations to ensure that wholesale electricity prices are just and reasonable,⁸ and it does not appear to have a well developed set of mitigation measures that it can choose from if it indeed finds that there is a significant market power problem. This is not a prescription for success in the identification of and effective response to serious market power problems.

By delaying its analysis of the problem, by failing to specify a clear definition of market power, by failing to specify or apply clear numerical criteria for evaluating market performance generally, and by ignoring constructive comprehensive proposals for mitigation, FERC did not in my opinion properly fulfill its responsibilities to respond to the California's market meltdown adequately or in a timely fashion. As summer is now upon us, the practical mitigation options for this summer are limited. At the very least, I would like to see FERC extend the number of hours to which the current mitigation rules apply, identify remaining loopholes, and close them. I also hope that California continues its efforts to remove unnecessary barriers to construction of new generating plants, to raise retail prices to reflect wholesale market prices, to restore credit to the system, and to continue its energy efficiency and conservation efforts. I would also like

⁸ A "perfect competition" standard would not be appropriate, but benchmarking market performance off of textbook competition models can be very useful. The question then becomes how to use the benchmark information to determine whether there is too much market power necessitating some kind of mitigation response.

to see Federal and California officials bury the hatchet and start to work more closely together in a cooperative fashion to find practical solutions to market performance problems

Until Congress amends the Federal Power Act to direct otherwise, FERC has the responsibility to guide restructuring and the expansion of competition in wholesale markets to achieve widely shared public interest goals, including reasonable wholesale prices for electricity. As FERC tackles this challenge it is important to keep in mind that “deregulation” is not a goal in and of itself. The goal is to create well functioning *competitive* markets that perform better than the regulated structures they replace.⁹ Significant market power problems must be addressed both before suppliers are given market-based pricing authority and, *if necessary*,¹⁰ after markets begin to operate as evidence about actual market performance and supplier behavior emerges from market experience.¹¹ Responsible regulators need to be in a position to evaluate alternative market design frameworks and to agree to allow only those to go forward that are likely to perform well. They must have the capabilities to identify serious market performance problems and to develop and apply reforms to fix them.

⁹ Neither regulation nor competition can yield “perfect” textbook outcomes. The goal is to do the best that we can in an imperfect world.

¹⁰ Clearly, it is also highly desirable for market rules to be sufficiently stable so that investors are not subject to unnecessary regulatory uncertainty. This suggests that reforms should be focused on serious market performance problems, that comprehensive rather than piecemeal reforms should be undertaken, and that legitimate investor expectations should be respected in the reform process.

¹¹ In this regard, FERC’s current “hub and spoke” method for evaluating potential market power problems in the context of market-based pricing applications is clearly outdated. Structural screens applying the methodology FERC uses in merger applications would provide better structural indicia of market power. These screens should be supplemented by information about the extent and nature of longer term hedging contracts in the relevant markets (e.g. what fraction of retail demand is covered with longer term contracts?), retail procurement arrangements, and on analyses of wholesale supplier and market behavior and performance based on actual market information. These analyses should encompass both generators and marketers of power.

If FERC is successfully to perform on its obligations it will have to change as well. FERC needs to become an agency with the human resources, organizational structure, administrative procedures and leadership that allows it to play an active constructive role in guiding resolution of wholesale market design issues, to be actively involved in ongoing monitoring of market performance, to develop and effectively apply objective market performance indicia, and to act quickly and cooperatively with the relevant state agencies, Independent System Operators, Regional Transmission Organizations, and market participants to fix serious market performance problems quickly once they have been diagnosed. FERC must also play a more active role in creating new organizational structures and regulatory institutions to govern the nation's currently balkanized transmission system.

As you evaluate how well FERC is doing in performing on its responsibilities, both with regard the mess in California and the evolution of wholesale markets in the rest of the country, I suggest that you seek answers to the following questions:

1. What specific market performance attributes does FERC believe characterize a well functioning competitive wholesale electricity market that meets its obligations under the Federal Power Act? For example, what is FERC's definition of market power?
2. What numerical indicia does FERC use to measure these attributes of competitive market performance based on actual market experience? For example, what indicia of market power does FERC rely on and how does it measure them empirically?

3. Does FERC have ready access to the data, and the human resources to make appropriate use of these data, necessary to construct and evaluate these indicia of market performance?
4. Does FERC interact closely with the market surveillance committees and market monitors that have been set up in some parts of the country, sharing analytical techniques, and data, to find solutions to market performance problems?
5. What criteria does FERC use to determine whether and when these numerical market performance indicia indicate that market performance does not meet the requirements for "just and reasonable rates" under the Federal Power Act? For example, what would lead FERC to conclude that there is too much market power in a market based on its evaluation of actual market experience?
6. Does FERC actively monitor market performance and take action on its own initiative or does it wait for complaints?
7. Does FERC feel the need to find that individual suppliers have done something "wrong" and are "at fault" to conclude that there are market performance problems or can it simply proceed with mitigation measures based on general evidence of market performance failures?

8. What menu of mitigation tools does FERC expect to rely on, in the short run and the long run, when these performance indicia indicate that the market is performing poorly?

CALIFORNIA PX DAY-AHEAD HOURLY PRICES
 (\$/Mwh: Weighted Averages 7 x 24)

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
January	-	21.6	31.8	260.2
February	-	19.6	18.8	363.0 (ISO)
March	-	24.0	29.3	313.5 (ISO)
April	23.3	24.7	27.4	370.0 (ISO)
May	12.5	24.7	50.4	
June	13.3	25.8	132.4	
July	35.6	31.5	115.3	
August	43.4	34.7	175.2	
September	37.0	35.2	119.6	
October	27.3	49.0	103.2	
November	26.5	38.3	179.4	
December	30.0	30.2	385.6	
AVERAGE	30.0	30.0	115.0	326.5

LESSONS LEARNED FROM THE CALIFORNIA ELECTRICITY CRISIS

Paul L. Joskow
MIT

- Electricity has unusual physical attributes that make the design of well functioning competitive wholesale power markets a significant technical challenge. Electricity markets don't design themselves via "the invisible hand." Effective market design requires substantial technical expertise and careful application of lessons learned from international experience. Market institutions and residual regulatory mechanisms need to be designed to be robust to extreme contingencies. Market and regulatory institutions need to be designed to be robust to extreme contingencies. Market power problems must be addressed both initially and as evidence about actual market performance and supplier behavior emerges as the markets operate. Responsible regulators need to be in a position to evaluate alternative market design frameworks and to approve only those that are likely to perform well. They must have the capabilities to identify serious market performance problems and to develop and apply reforms to fix them. California relied on "market design by committee" and allowed mindless free-market rhetoric and interest group politics, to ignore technical realities, international experience and common sense.
- Competitive electricity markets will not work well if consumers are completely insulated by regulation from wholesale market prices. California deregulated wholesale prices, but failed to deregulate retail prices or to allow the utilities to use forward contracts to hedge their default service supply and pricing obligations. The terms and conditions of default service made it necessary for utilities to buy at an unregulated hourly wholesale spot market price and to sell at a fixed regulated retail price for up to four years. Not only did this drive the utilities to the point of insolvency after wholesale prices rose above the fixed retail price in June 2000, but it has also made it very difficult for competing retail suppliers to attract customers or for consumers to respond to high prices by reducing consumption.
- Spot electricity markets work very poorly when supplies are tight; the combination of relatively tight supplies and extremely inelastic demand means that prices can rise to extraordinary levels and are much more susceptible to market power problems than when supplies are abundant. One way to help to protect consumers from volatile and excessive spot markets for electricity is to ensure that a large fraction of consumer demand is covered by longer term fixed price contracts negotiated under competitive conditions well in advance of spot market crises. These contracts both protect consumers from price volatility (they act like an insurance policy) and reduce incentives suppliers have to exercise market power when supplies get tight. Such contracts can also facilitate financing of new power plants. A good retail procurement framework, whether it relies of utility distribution companies, competitive electricity service providers (ESPs), or

a combination of both, must assure that a large fraction of retail demand is being met with longer term fixed price contracts and only a small fraction fully exposed to the spot market.

- In addition, the default service option for larger commercial and industrial consumers should be to purchase their electricity at real time prices. Real time pricing at the retail level introduces demand elasticity into the spot *wholesale* market and this in turn dampens price volatility and helps to mitigate supplier market power. (These customers should also have the option of hedging some or all of their demand with contracts purchased from electricity marketing intermediaries or their distribution company.) California both refused to allow the entities (the utility distribution companies) with the responsibility to procure supplies for 85% to 90% of the retail demand to enter into *forward contracts* and ignored proposals for demand response programs that would allow customers to respond to wholesale price spikes by reducing consumption.
- The primary benefits of electricity sector reform will occur in the long run as a consequence of investments in new more efficient power plants, the introduction retail risk management, demand management and energy efficiency services, and continuing innovations on both the supply and demand sides. Speeding the ability of developers to site and build new generating plants and providing good incentives to expand transmission networks, all of which meet reasonable environmental standards, is essential for good long run market performance. Removing unnecessary administrative barriers to entry allows supply to increase more quickly as market conditions make it profitable to do so and will reduce the likelihood of extreme contingencies. California focused too much on illusive short run gains from low-priced power that was available when there was excess capacity and focused too little on creating sound institutional arrangements to support investments in new generation and transmission facilities.
- All electricity market reform programs have experienced some problems at the outset. Mid-course corrections have almost always been necessary to mitigate market performance problems. When market performance problems emerge, government officials must act quickly and decisively to fix the problems. Ongoing market reforms and regulatory "mitigation" initiatives designed to remedy serious market performance problems should be an *expected* feature of the process of creating efficient competitive wholesale electricity markets. If the California and federal regulators had done so in September 2000 when the current problems became crystal clear, they would have reduced significantly the ultimate magnitude of the crisis. Unfortunately, both the CPUC and FERC acted too slowly and ineffectively as the crisis deepened and spent most of their energies pointing fingers of blame at one another rather than working together cooperatively to find a solution.
- The recent events in California, as well as less severe problems in other electricity markets in the U.S., also raise questions about whether federal (FERC) regulators

are up to the task of supervising the design and diffusion of well functioning competitive electricity markets, effectively monitoring market performance, identifying and measuring performance problems, developing and implementing reforms to fix them. FERC's responses to the problems in California, as well as to problems that have emerged in other regions, have not been satisfactory. FERC needs to become an agency with the human resources, organizational structure, administrative procedures and leadership that allows it to play an active constructive role in guiding resolution of wholesale market design issues, to be actively involved in ongoing monitoring of market performance, to develop and effectively apply objective market performance indicia, and to act quickly and cooperatively with the relevant state agencies and Regional Transmission Organizations to fix serious market performance problems when they emerge.

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Testimony to The United States Senate Committee on Governmental Affairs

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Washington, DC

Power prices in California are too high because the power market has a real shortage caused by serious structural flaws in the market design and in its implementation. When the state set up its partially deregulated market through its 1996 deregulation legislation, California did not follow the example of other power markets that use rules to create a market for capacity. In addition, California's complex siting and permitting processes have created formidable barriers to the development of the new generating capacity that the state so badly needs. Quite simply, California ran out of capacity because it did not set up a market to pay for it or a process to enable it. A third flaw in California's market design was the use of price caps in its retail power rates. As scarcity drove up wholesale power prices in 2000, the majority of customers in California continued to consume power at retail price levels frozen below 1996 levels. The retail price caps distorted the market by increasing demand and driving price spikes higher. Yet, utilities remained obligated to provide all the power people wanted at capped prices. As a result, price caps had the unintended consequence of driving Pacific Gas and Electric, California's largest

utility with \$22 billion dollars of assets, from an “A” credit rating to bankruptcy court in less than four months.*

Price caps—although well intentioned—usually distort the market and create unintended consequences. We have already seen this in California, and the history of broadly applied wage and price controls or targeted controls on energy prices like natural gas in the 1970s is also a record of distortions and unintended consequences. Price controls always create unintended consequences and shift activity into unproductive directions. We can be sure that price caps on power in California today will do one thing: prolong California's agony. They will not add one watt of generating capacity.

Price caps may sound simple in theory. In fact, they are anything but simple. The bureaucracy to administer them always becomes many more times complicated than originally expected. Controls will create confusion. There will be immense arguments over how to set them and over how they are implemented and enforced—and by whom. What they will certainly and absolutely do is discourage new investment. As it is, investment is already being driven away by the fevered political rhetoric, the variegated threats, the prospect of state takeover, the chaotic policies the state has already applied, and the amazing but evident willingness of the state to enforce policies that drove its largest utility into bankruptcy—and are turning the state's surplus into a huge deficit. This is not a state that is creating an environment favorable to new investment or, more fundamentally, serving its citizens. Price controls—and the rancor and confusion that will accompany them—will make a bad situation much worse.

* See the CERA Special Report *Beyond California's Power Crisis: Impact, Solutions, and Lessons*

Many people want price caps because they believe that power suppliers are withholding capacity to drive up prices in California. If this were true, then price caps would limit their gains. Further, this argument goes, if we could just get them to knock it off, then this artificial shortage would end and power prices would drop back down to reasonable levels. Why do so many people want to believe in market power? Putting the blame on suppliers diverts blame from the basic design flaws and weaknesses in the California power market—and the failure to address those flaws and weaknesses. Of course, as long as we continue to disagree on the cause of the problem, a consensus on the solution will remain elusive. Even worse, if we misdiagnose this problem as one of market power, then we will pursue solutions that at best do not fix the problem and at worst, have the potential to further distort the market and create new problems.

An examination of the California power market does not support the market power hypothesis. Power generators have market power if they can act to set prices. The California power exchange began operation in 1998. In anticipation of the new competitive power market in the West, CERA developed a computer model to analyze the interactions of supply and demand in determining wholesale prices. When we simulate the western power market in 1998 and 1999 and compare the results with the actual market-clearing prices, the evidence is quite compelling. During this period the California power market was in a demand and supply balance, and we observe that wholesale power prices cleared at the level of short-run operating costs—fuel, environmental costs, and other operating and maintenance costs. Over this time frame, the California energy market was doing just what it ought to do: efficiently determining

the utilization of power plants to meet demand at each hour with price signals reflecting the operating costs of rival producers.

We must confront the fact that the industry structure that delivered a competitive outcome in 1998 and 1999 did not change in 2000. What did change was the demand and supply balance. All the heated political accusations do not change that blunt fact. Since no significant new power generating capacity entered the California power market in the past several years, a shortage occurred in 2000 because demand growth finally outstripped supply.

California instituted its partial and contradictory deregulation—and I emphasize partial and contradictory deregulation—in the middle 1990s, when the state was coming out of an economic downturn and had considerable surplus capacity. In retrospect, it is clear that an underlying assumption was that the surplus would persist and that the future would take care of itself. That was okay until the state started to grow again. Between 1996 and 2000, the state's economy grew by 29 percent. Electric power demand grew by 24 percent. Yet, over a ten year period, no new power generating capacity was added in the state. This is a simple recipe for a shortage—and that is the plight that California finds itself in today. We estimate that the state, with normal weather conditions, has about 10 percent less generating capacity than it needs to meet peak demand periods this summer.

Any market that has a severe shortage of a product that consumers value highly and for which they have few substitutes will end up with many buyers bidding up scarce supply. In other words, a "shortage premium" will arise. It is this bidding up process by the buyers that creates the shortage premium. If we have a wet hydro year in 2002, the

shortage will temporarily disappear. Under such conditions, we fully expect the market structure to deliver prices reflecting short-run costs without a shortage premium. On the other hand, if suppliers do have market power, then the incentive to exercise control over prices is even greater under such conditions than it is today and prices will remain high. Time will tell—the past already provides clear evidence that this is a shortage premium and we expect the future will too.

We must recognize that when supply and demand were in balance the competitive energy market in California produced prices with a level and volatility that was half of what was necessary to support new power plant investment. During 1998 and 1999 the annual wholesale price of power was between \$14 and \$30 per megawatt-hour. The evidence is clear—the energy market alone in California did not provide a timely price signal for new investment. As a result, the shortage was both predictable and preventable. As early as April 1997 we wrote in our analysis of California's new market: "There is no reliable mechanism [in California] to pay for the fixed and operating costs of new generating facilities, since the means for doing so (e.g., long-term contracts, high ancillary services payments) are unlikely to be widely available for several years given the rate freeze and above-noted trend toward low PX prices. That is likely to lead to extended periods of low prices followed by periods of very high prices, as supply shortages and surpluses develop. Price volatility will not be conducive to a smooth transition to competition."* Other markets that had capacity markets along with energy markets—like Texas and New England—were able to attract more than enough new

* April 25, 1997, California Energy CERA Briefing Note *Restructuring by the Pound*.

features of the current debate is the failure to examine how better-conceived deregulation policies are working in other states.

Price caps will not add capacity or reduce demand. Price caps provide a limited tool to deal with power prices that are too high. First, only half of the power produced in the western power market is subject to the Federal Energy Regulatory Commission jurisdiction. FERC price caps will create incentives to run controlled power through uncontrolled sellers to end-run the patchwork coverage. Second, time and again we have seen price caps set in such a way as to withdraw supply. Current proxy price caps are set based on operating costs using an average fuel price estimate. As a result, when generators face a higher-than-average fuel price, they have the perverse incentive not to operate. This point is often overlooked. But it is very dangerous to overlook it at a time when California is confronted by the prospect of blackouts. This indicates the type of distortion to expect from price caps.

We must face the facts that California competes with other power systems around the world to attract power plant investment and that price caps discourage investment. Remember: the power business is one of the most capital-intensive businesses in the US economy. California remains a highly flawed power market in which the only way to recover costs above short-run operating costs is through a periodic shortage premium. By adding price caps to the current flawed California market design, investors will see no way to recover the full costs of a power investment through the market. California cannot afford to continue to bring forth power development by guaranteeing payment through long-term power purchase contracts from the Department of Water Resources. The state's record in long-term power contracting is abysmal. Recall that half the stranded costs in California that drove the state to deregulate were due to long term power contracts the state mandated under the Public Utility Regulatory Policy Act.

California still has not fixed its market to create a positive investment climate for power development. To assist California, the FERC should insist on a minimum set of structural elements in its wholesale power market design. It will be a mistake to make price caps the centerpiece of a federal response to the California power shortage. They would make a bad situation worse, and they do nothing to fix the flaws that so desperately cry out for solution.

**Statement of
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Professor of Economics, Stanford University
Chairman, Market Surveillance Committee, California Independent System Operator
Before the
Senate Committee on Governmental Affairs
June 13, 2001**

Chairman Leiberman and Members of the Committee, I am pleased to submit this written statement concerning the role of the Federal Energy Regulatory Commission in the functioning of the electricity market in California. I am a Professor of Economics at Stanford University. I began my work on energy and environmental issues at the Los Alamos National Laboratory (LANL) in 1980. The following year I entered graduate school at Harvard University, where I received a S.M. in Applied Mathematics and Ph.D in Economics. For the past fifteen years, I have been engaged on research program studying the process of privatization, competition and regulation in network industries such as electricity and natural gas. A major focus of my work is the empirical analysis of market power and, more generally, market design issues in newly restructured electricity markets. I have studied the design and operation the PJM (The Pennsylvania, New Jersey, and Maryland Interconnection), New York, New England and California electricity markets, as well as virtually all re-structured electricity markets currently operating around the world. Since April 1, 1998, I have been the Chairman of the Market Surveillance Committee (MSC) for the Independent System Operator (ISO) of California electricity industry.

MARKET SURVEILLANCE COMMITTEE

To provide further background on my expertise on the California electricity market, it is useful to describe the role of the Market Surveillance Committee of the California Independent System Operator and the activities that I have undertaken as its Chairman. The MSC is an independent committee charged with monitoring the California electricity market for the exercise of market power and for market design flaws which may enhance the ability of market participants to exercise market power. The MSC was required by the Federal Energy Regulatory Commission as part of the market monitoring function of the California ISO. Because the California ISO had a board of governors composed of employees from firms participating in the California market, as well as stakeholders from state agencies and regulatory bodies, FERC mandated the formation of an independent market monitoring entity to prepare and file with FERC periodic reports on the performance of the market. This is a major role of the MSC. In this capacity I have written or

coauthored more than ten reports on aspects of the design and performance of the California electricity markets during my three years as Chairman of the MSC. In preparing the MSC reports I have analyzed confidential data made available by the ISO on bidding, scheduling and production by all generation unit owners selling into the California. In addition, the MSC has worked closely with the Department of Market Analysis at the ISO in preparing these reports. These reports, along with other papers I have written on competitive electricity markets, are listed at the end of my testimony.

FEDERAL OVERSIGHT OF THE ELECTRICITY INDUSTRY

In 1935, Congress passed the Federal Power Act which imposed a statutory mandate on the Federal Power Commission, the predecessor to the Federal Energy Regulatory Commission (FERC), to set "just and reasonable" wholesale electricity prices. An accepted standard for just and reasonable prices are those that recover production costs, including a "fair" rate of return on the capital invested by the firm. Moreover, if the FERC finds that wholesale electricity prices are unjust and unreasonable, the Federal Power Act gives it authority to take actions that result in just and reasonable prices. Finally, the Federal Power Act requires that FERC order refunds for any payments by consumers for prices in excess just and reasonable levels.

Approximately ten years ago FERC embarked on an explicit policy to promote wholesale electricity markets throughout the US. The price a generation unit owner receives from selling into a wholesale electricity market is determined by the willingness of all generation unit owners to supply electricity, rather than an administrative process that uses the firm's production costs and a rate of return on capital invested to determine the price it receives for electricity.

MARKET POWER IN ELECTRICITY MARKETS

The just and reasonable price standard for wholesale electricity prices required by the Federal Power Act presented a significant legal and regulatory challenge for FERC because markets can set prices substantially in excess of the production costs for sustained periods of time. This occurs because one or more firms operating in the market have market power--the ability to raise market prices through their unilateral action and profit from this price increase.

Without proper protective measures in place, spot wholesale electricity markets are particularly susceptible to the exercise of market power because of how electricity is produced, delivered and sold to final customers. The production of electricity is characterized by binding

capacity constraints because a generating unit with a nameplate capacity of 500 megawatts (MW) can produce only slightly more than 500 megawatt-hours (MWh) of energy in a single hour. These capacity constraints limit the magnitude of the short-run supply response of each firm to the attempts of its competitors to raise market prices.

Electricity must be delivered to all customers over a common transmission grid which is often subject to congestion, particularly along transmission paths to major metropolitan areas. Transmission congestion limits the number of generators able to sell power into the congested region. This reduces the potential supply response to the attempts of firms selling into this smaller market to raise prices through the unilateral exercise of market power. Finally, for a variety of reasons, the hourly demand for electricity is virtually insensitive to the value of the hourly wholesale price, so that if all generators bid higher prices they face virtually no risk of selling less electricity in that hour.

When the demand for electricity is high because of hot weather, the probability of transmission congestion is usually very high. During these system conditions, generation unit owners can be confident that least some of their capacity will be needed to serve the price-insensitive aggregate wholesale demand. These firms also recognize that any reduction in the quantity of electricity sold because of high bid prices will be more than compensated for by the significantly higher market prices they will receive for all sales they do make. For this reason, the unilateral exercise of market power by these firms through their bidding behavior leads to higher profits than they could achieve if they did not bid to influence market prices.

The long time lag necessary to construct new generation capacity can result in long periods of significant market power in an electricity market. This feature of the electricity industry makes potential economic damage associated with the exercise of market power extremely large. Even under the most optimistic scenarios, the time from siting a sizable new generating facility to producing electricity from this facility can range from 18 to 24 months. This estimate does not include the time necessary to obtain the permits needed to site the new facility, which can sometimes double the time necessary to bring the new plant on line. For this reason, once market conditions arise which allow existing generating facilities to exercise substantial amounts of unilateral market power, as is currently the case in California, these market conditions are very likely to persist for a long enough period of time to impose substantial economic hardship on consumers. At a minimum,

this interval of significant economic hardship is the shortest time period necessary to site and construct enough new generation capacity to create the competitive conditions necessary to reduce the ability of existing firms to exercise their unilateral market power.

California is currently at the beginning of this time interval of economic hardship. Not until the autumn of 2002 or the winter of 2003 is there a significant likelihood that sufficient new capacity will be on line in California to provide a large enough supply response to discipline the ability of existing firms to exercise their unilateral market power.

PRE-CONDITIONS FOR GRANTING MARKET-BASED PRICING AUTHORITY

Because of this very large potential harm from the exercise of unilateral market power by firms in a competitive electricity market, the FERC has determined that unless a firm can prove that it does not possess market power it is not eligible to receive market-based prices. It can, however, receive prices for any electricity produced that are set through a cost-of-service regulatory process administered by the FERC. An implication of FERC's logic for granting market-based rate authority is that only if all firms participating in a market possess no market power will the price set by the market satisfy the just and reasonable standard of the Federal Power Act.

Specifically, before it allows any market participant to receive a market price rather than a pre-existing cost-based price set through a regulatory process, the FERC requires each participant to demonstrate that it does not have market power. In other words, each market participant must submit sworn testimony to the FERC demonstrating it does not have the ability to raise market prices and profit from this behavior. Those generators unable to demonstrate that they do not have market power or have not adequately mitigated that market power are not eligible to receive market-based rates, but do have the option to sell at cost-of-service prices set by FERC.

Each of the new generation unit owners and power marketers made these market-based rate filings before they began selling into the California market and, in many cases before the California market began operation in April 1998. Each firm had its authority to receive market prices approved by the FERC for a three-year period. Because of the timing of the transfer of assets from the California investor-owned utilities—Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric—to the new owners—Duke, Dynegy, Reliant, AES/Williams and Mirant—some these entities did not begin selling into California at market-based rates until a later date. As

consequence, this authority to sell at market-based rates expires before summer of 2001 for a subset of these firms.

These firms have recently filed at FERC to renew their market-based rate authority. According to FERC rules under the just and reasonable rate standard of the Federal Power Act, these firms must once again demonstrate that they do not possess market power or have adequately mitigated this market power in order to be eligible to receive market-based rates for another three-year period. If they are unable to do so, then they are still able to receive prices for their sales set through a cost-of-service regulatory process.

A major source of potential error in determining whether a market participant is eligible to receive market-based rates is the fact that is extremely difficult determine on a prospective basis whether a firm possesses market power. A second source of potential errors is that the methodology used by the FERC to make this determination uses analytical techniques that have long been acknowledged by the economics profession as grossly inadequate. This analysis is based on concentration indexes applied to geographic markets that do not account for the fact that electricity must be delivered to final customers over the existing transmission grid. This analysis does not recognize the crucial role that demand and other system conditions play in determining the amount of unilateral market power that a firm can exercise. Most important, it does not acknowledge the crucial role played by a market's bidding, scheduling and operating protocols in determining the extent market power that can be exercised by a firm in a competitive electricity market. One of the most useful lessons I have learned from my research and experience with wholesale electricity markets, is that very small changes in market rules can exert an enormous impact on the ability of a firm to exercise market power.

EARLY EXERCISE OF MARKET POWER IN CALIFORNIA

As early as July of 1998, there were clear instances of the exercise of unilateral market power in the California electricity market. Since August of 1998, the Market Surveillance Committee of the California ISO, which I chair, has prepared a number of reports on the performance of the California electricity market documenting the extent of market power exercised. In July of 1999, in research with Severin Borenstein and James Bushnell at the University of California Energy Institute, I presented measures of the extent of market power exercised in the California electricity market from June 1998 to September of 1998. Since that time, this analysis has been periodically

updated as more recent market performance data becomes available. This monthly index of the exert of market power exercised in California electricity market currently exists from June 1998 through December of 2000. All the Market Surveillance Committee reports including this research with Borenstein and Bushnell have been filed with the FERC. A chronology of these reports and filing is given below.

EVIDENCE OF MARKET POWER FILED WITH FERC

Before my discussion of the evidence for the exercise of market power in the California electricity market, I would like to describe a particular challenge faced the MSC. As discussed earlier, the primary role MSC as envisioned by FERC is to monitor the ISO markets for the exercise of market power. However I have been unable to find in the ISO tariff or any FERC orders on the California electricity market a standard for the MSC to apply in determining whether the bidding, scheduling or operating behavior of a generation unit owner constituted the exercise of market power that was unacceptable under the just and reasonable rate standard of the Federal Power Act. I have also been unable to find in the ISO tariff or any FERC orders on the California electricity market a standard for the MSC to apply in determining whether market prices violated the just and reasonable rate standard. A number of meetings with staff at the FERC to discuss these issues, failed to elicit either of these standards that the MSC could use to monitor the California electricity market. As late as July 27-28, 2000, in a meeting of the representatives from the market monitoring units of the California, New York, New England and PJM ISOs with staff from the Office of Markets, Tariffs and Rates at FERC at the Baltimore-Washington Airport, I was unable to elicit a clear standard for either unacceptable prices or the unacceptable exercise market power, despite this topic being the first agenda item on the first day of the conference.

For this reason, the MSC decided to use the standard definitions used in the economics profession for determining whether market prices reflected the exercise of market power or a firm was bidding, scheduling or operating to exercise its unilateral market power. All of the discussions of market power and the exercise of market presented in this section are based on these standard definitions from the economics profession.

In July of 1998, California's energy and ancillary services markets experienced the first of many episodes of the exercise of significant market power. Perhaps the most dramatic illustration of this activity took place in the ISO's Replacement Reserve market. A generator providing

Replacement Reserve agrees to provide standby generation capacity available with 60 minutes notice. A generation unit owner providing this service also submits a bid schedule to supply energy in the ISO's real-time energy market if the unit owner wins in the Replacement Reserve market. Because a generation unit owner providing this service has the right to receive the ISO's real-time price for any energy it provided from this reserve capacity, the market price for this product averaged less than \$10/MW during the first three months of the California market.

On July 9, 1998, because of the unilateral exercise of market power by firms selling into this market, the price of Replacement Reserve hit \$2,500/MW. In the following days, the ISO cut its Replacement Reserve demand in half, but these attempts were largely unsuccessful in limiting the amount of market power exercised in this market. On July 13, 1998 the price of Replacement Reserve hit \$9999.99/MW. A rumor circulating at the time claimed that the only reason the market participant had not bid higher than \$9999.99/MW was because of a belief that the ISO's bid software could not handle bids above this magnitude. During this same time period, prices in the California Power Exchange day-ahead energy market and ISO real-time energy market reached record high levels.

As result of these market outcomes, the ISO management made an emergency filing with FERC for permission to impose hard price caps on the ISO's energy and ancillary services markets at \$250/MW(h). The FERC granted this request to give the ISO the authority to impose price caps on their energy and ancillary services markets. FERC also directed the MSC to prepare a report on the performance of the ISO's energy and ancillary services markets. The August 19, 1998 MSC Report noted that the ISO's energy and ancillary services markets were not workably competitive.¹ This report identified a number of market design flaws which enhanced the ability of generators to exercise their unilateral market power in the California electricity market. The report contained a number of recommendations for correcting these market design flaws.

In response to the August 1998 MSC Report, FERC issued an order implementing various market rule changes and asked the MSC to prepare a report analyzing the impact these market rule changes on the performance of the ISO's energy and ancillary services markets. The March 25, 1999 MSC report provided an analysis of the market power impacts of the re-design of the ISO's

¹ Available at <http://www.caiso.com/docs/1998/12/18/1998121806493813577.pdf>.

ancillary services markets and its reliability must-run contracts.² The major focus of this report was whether the FERC should continue to grant the ISO the authority to impose “damage control” price caps on the ISO’s energy and ancillary services markets. The MSC concluded that the California electricity market was still not yet workably competitive and was susceptible to the unilateral exercise of market power because of an over-reliance on day-ahead and shorter time-horizon markets for the procurement of energy and ancillary services and the lack of demand responsiveness in the hourly in the wholesale demand. For these reasons, the MSC strongly advocated that FERC extend the ISO’s authority to impose price caps on the real-time energy and ancillary services markets.

On October 18, 1999, the MSC filed a report with FERC reviewing performance of the market since the March 25, 1999 report.³ The focus of this report was a comparison of the performance of the California electricity market during the summer of 1999 versus the summer of 1998. The measure of market performance used in this report is based on the methodology for measuring market power in wholesale electricity markets described in the study by Borenstein, Bushnell and Wolak.⁴

This measure of performance compares average actual market prices to the average prices that would exist in a market where no generators are able to exercise market power. This analysis controls for the changing costs of production for generation owners due to input fuel price changes, forced outages and import availability. This standard of a market in the absence of market power was selected because it is consistent with the standard FERC uses to determine whether market prices yield just and reasonable prices.

Based on this measure of market performance, as well as other factors, the October 1999 MSC report concluded that significant market power still existed in California’s wholesale energy market, despite the fact that the performance of the California electricity market was significantly improved during the summer of 1999 relative to the summer of 1998. The October 1999 MSC report emphasized that a major reason for the superior performance of the market during the summer of

²Available at <http://www.caiso.com/docs/1999/04/06/1999040616452832384.pdf>.

³Available at <http://www.caiso.com/docs/1999/10/20/199910201045345098.pdf>.

⁴Available from <ftp://zia.stanford.edu/pub/papers/elecmarq.pdf>.

1999 versus the summer 1998 was the significantly milder weather conditions and corresponding lower peak load conditions during the summer of 1999 versus the summer of 1998.

This report also noted that the major factors allowing generation unit owners to exercise market power in the California energy and ancillary services markets—the lack forward financial contracting by the load-serving entities and the lack of price-responsive wholesale demand—remained unaddressed. The report provided several recommendations for re-designing California's retail competition policies in order to address these market design problems. This report also noted that if these issues were not addressed as soon as possible or generators would have significant opportunities to exercise market power in the California electricity market during the summer of 2000.

In March of 2000, the MSC was asked by the Board of Governors of the ISO to provide an assessment of whether the California energy and ancillary services markets are workably competitive and offer an opinion on the appropriate level of the price cap on the ISO's energy and ancillary services markets for the summer of 2000. In its March 9, 2000 opinion, the MSC concluded that these markets were not likely to be workably competitive for the summer of 2000, for the same reasons that it concluded in previous MSC reports that these markets were not workably competitive during the summers of 1998 and 1999.⁵ This opinion also summarized an update of the market power measures of Borenstein, Bushnell and Wolak through the summer and autumn of 2000.

This opinion also provided a prospective assessment of the impact on average wholesale electricity prices of the exercise of market power at various levels for the price cap on the ISO's real-time energy market during the summer of 2000. Because of a divergence of viewpoints among the members of the MSC about the increased opportunities to exercise market power at a higher price cap during the summer of 2000, the MSC did not offer an opinion on the level of the price cap, but instead explained to the ISO board the tradeoffs it should take into account in setting the level of the price cap for the summer of 2000.

Conditions during the summer of 2000 throughout the entire western US presented generators located in California with many opportunities to exercise market power at levels far greater than those observed during the summer of 1998 and 1999. California historically relies on imports to meet

⁵ Available from <http://www.caiso.com/docs/09003a6080/04/30/09003a60800430ed.pdf>.

approximately 25% of its electricity needs. During the summers of 1998 and 1999, the availability of significant amounts of energy outside of California disciplined the attempts of generators located in California to raise market prices through their bidding behavior.

Hydro conditions during the summer of 2000 throughout the Pacific Northwest and demand conditions in the Desert Southwest left significantly less available energy from these regions to import into California. As a consequence, generators located in California faced a significantly smaller import supply response when they attempted raise prices through the unilateral exercise of market power. Consequently, they were able to exercise market power at unprecedented levels during the summer of 2000. A variety of factors contributed to the decline in available import during the summer of 2000.⁶

As a result of conditions in the California electricity market during the early summer of 2000, on September 6, 2000, the MSC filed a report at the request of the chairman of the Board of Governors of the California ISO on the performance of the market during the summer of 2000.⁷ This report quantified the unprecedented levels of market power exercise during June of 2000, the last month of data analyzed. Specifically, this report noted that average prices during June 2000 were 182% above the monthly average price that would have occurred had no generators exercised their unilateral market power. In March 22, 2001 the MSC filed an update of these monthly measures of the extent of market power exercised through December of 2000.⁸ This study showed that these extremely high levels of market power continued through November and December of 2000, months in which generators were historically able to exercise limited amounts of market power.

A number of independent studies have quantified the extent of market power exercised by firms in the California electricity market. Using a similar methodology to that employed by Borenstein, Bushnell and Wolak, Paul Joskow and Edward Kahn quantified the extent of market power exercised during the summer of 2000. Moreover, they provided firm-level evidence of supply withholding to exercise market power during many hours of the summer of 2000. Eric Hildebrandt of the Department of Market Analysis of the California ISO also documented the degree to which

⁶“What Went Wrong With California’s Re-structured Electricity Market (And How to Fix It)” describes these factors in more detail (<http://zia.stanford.edu/pub/papers/california.print.pdf>).

⁷ Available from <http://www.caiso.com/docs/09003a6080/07/dc/09003a608007dc78.pdf>.

⁸ Available from <http://www.caiso.com/docs/2001/03/22/2001032214473821567.pdf>.

prices exceeded levels that would exist in market where no firms exercised market power over period May 2000 to February 2001. Anjali Sheffrin, Director of the Department of Market Analysis of the California ISO examined bidding behavior in the California ISO real-time energy market and found that economic withholding, exercising market power by bidding substantially in excess of production costs was observed in virtually all hours during May 2000 to November 2000.

These studies demonstrated that contrary to their filings stating otherwise, all five of the out-of-state generators—AES/Williams, Duke, Dynegy, Reliant and Southern (recently renamed Mirant) possess and have exercised significant market power in the California electricity market. The study prepared by Anjali Sheffrin also demonstrates that the large suppliers located outside of the California ISO control area also possess and have exercised substantial market power in California electricity market. These entities include British Columbia Hydro, the Los Angeles Department of Power and Water, and the Bonneville Power Administration.

FERC RECOGNITION OF UNJUST AND UNREASONABLE RATES

On November 1, 2000, FERC issued an order proposing remedies for the California wholesale electricity market. In this report, the FERC concluded that wholesale electricity prices during the summer and autumn of 2000 were unjust and unreasonable and reflected the exercise of significant market power. This order proposed replacing the \$250/MW(h) hard cap on the ISO's real-time energy and ancillary services market with a soft cap of \$150/MW(h). This soft price cap requires all generators to cost justify bids in excess of \$150/MWh. If this quantity of energy or ancillary services is needed by the ISO, then this firm will be paid as bid for its sales. This order also proposed to eliminate the requirement that all California investor-owned utilities buy and sell all of their day-ahead energy requirements through the California PX. In addition to several other market rule changes, this preliminary order required that the ISO implement a penalty on all loads of \$100/MWh for any energy in excess of 95% of their actual consumption that is purchased in the ISO's real-time energy market. FERC also invited comment on these proposed remedies.

On December 1, 2000, the MSC filed comments on these proposed remedies.⁹ The MSC concluded that "the Proposed Order's remedies are likely to be ineffective to constrain market power and, in fact, could exacerbate California's supply shortfalls and, thereby, increase wholesale energy

⁹ Available from <http://www.caiso.com/docs/2000/12/01/2000120116120227219.pdf>.

prices.” The MSC concluded that the proposed remedies would be likely to cause the California Power Exchange to declare bankruptcy with little impact on wholesale electricity prices. The MSC, as well as other entities commenting on the order, observed that the Commission’s soft cap would function very much like a price cap because market participants could use affiliate transactions or other means to make the cost (paid by the affiliate that owns the generation unit) of providing energy or ancillary services to California consumers extremely high. The MSC also argued that the order’s penalty on load for purchasing excessive amounts of energy in the real-time market would do little to solve the significant reliability problems that the California ISO was facing because of the enormous amounts of generation and load that appeared in the ISO’s real-time energy market.

The December 1, 2000 MSC report also proposed a comprehensive plan to mitigate the enormous market power being exercised in the California electricity market. This plan provides guaranteed relief for California consumers from unjust and unreasonable wholesale electricity prices over the next two years. Moreover, it also provides the strongest possible incentives for generators to selling into the California to make their capacity available during high load conditions and therefore minimize the risk of rolling blackouts.

In its final order directing remedies for the California electricity market on December 15, 2000, FERC reiterated its statement that wholesale electricity prices in California were unjust and unreasonable and reflected the exercise of market power. Despite comments from a variety of parties warning of adverse impacts of its proposed remedies, FERC adopted them with only minor modification. On December 8, 2000 the ISO management and board unilaterally implemented the FERC soft-cap at a \$250/MWh level. This meant that from this date going forward, any generator that could cost-justify its bid above \$250/MWh would be paid as-bid for the electricity they supplied in the ISO’s real-time market. Effective January 1, 2001, when all of the remedies ordered by FERC were implemented, this soft cap was set at \$150/MWh.

On February 6, 2001, the MSC filed with FERC a further elaboration and clarification of its proposed market power mitigation plan outlined in the December 1, 2000 MSC report.¹⁰ This report noted that many of the warnings about the likely impact of the remedies in FERC’s December 15, 2000 order given in the December 1, 2000 MSC report had been borne out by the events of January

¹⁰ Available from <http://www.caiso.com/docs/2001/02/26/2001022608400127457.pdf>.

2001. The February 6, 2001 MSC report noted that the average wholesale energy price during January 2001 was \$290/MWh, despite the existence of a \$150/MWh soft cap on the ISO real-time energy market. Moreover, California experienced, for the first-time, two days with rolling blackouts due to insufficient generation capacity available to serve the California market.

It is important to emphasize that these rolling blackout occurred during a month when the daily demand for electricity is near its lowest annual level. For example, the peak demand in January 2001 was approximately 30,000 MW. The peak demand during the summer of 2000 was slightly less than 44,000 MW. This occurred during August of 2000 when the average price of wholesale electricity was slightly less than \$180/MWh. Consequently, despite a significantly lower peak demand and significantly less energy consumed daily, prices in January of 2001 (when the FERC's remedies were in place) were more than \$100/MWh more than prices during August of 2000, the month with the highest average price during the summer of 2000. Moreover, the California ISO experienced no Stage 3 emergencies and no rolling blackouts during August of 2000, whereas it experienced almost daily Stage 3 emergencies and two days with rolling blackout during January of 2001.

The February 6, 2001 report also described the perverse incentives the FERC soft-cap created for generators with natural gas affiliates selling into California. This report outlines logic that illustrates how these firms can use affiliate transactions to raise the announced spot price of natural gas in California and thereby cost-justify higher electricity bids under the FERC soft-cap. It also presented evidence that the persistent divergence in natural gas prices in California relative to the rest of the western US could be attributed to this activity. Finally, this report described a fundamental difference in the incentives faced by generation unit owner in wholesale electricity markets and the former vertically-integrated monopoly regime. That is the enormous potential profit increase to generators selling into an electricity market from declaring forced outages at their facilities. By declaring a forced outage, a generation unit owner is able to create an artificial scarcity of generation capacity and therefore pre-commit itself not to provide an aggressive supply response to the attempts of its competitors to raise market prices through their bidding behavior. Under the former vertically-integrated monopoly regime, the generation owner has little incentive to declare forced outages because it still retains the obligation to serve final retail demand. A forced outage

requires this firm to operate more expensive units or purchase power from other firms to meet its demand obligations.

This report also notes the practical impossibility of verifying whether a declared forced outage truly means that the plant is unable to operate. An analogy is drawn to the labor market where an employee might call his boss to claim a sick day. It is virtually impossible for the employee's boss to determine whether that employee can in fact work despite his request for a sick day. Similar logic applies to the attempts of the ISO, FERC, or any other independent entity to verify if a declared forced outage in fact means that the plant is truly unable to operate. By this logic, planned or unplanned outages become very powerful tools that owners of multiple generation units can use to exercise their unilateral market power.

On this point, it is important to bear in mind that the California ISO control area has slightly over 44,000 MW of installed capacity. Consequently, for a capacity shortfall sufficient to cause rolling blackouts to occur when peak demand is 30,000 MW, over 14,000 MW of capacity must be either forced or planned out. For Stage 3 emergencies to occur, only slightly less capacity must be forced or planned out. All of these calculations assume that no imports are available to sell into the California market. With some imports, these numbers must be even larger. California has over 10,000 MW of available transmission capacity to deliver energy into the California market, so that unless the amount of energy available to import in California is limited, as it has been since the summer of 2000, this use of generation outages to exercise market power is likely to be unprofitable. However, these calculations provide strong evidence for the view that the unprecedented level of forced outages over the winter of 2001 may be due in part to the increased ability to exercise market power that limited amounts of surplus energy outside of California and a high level of generation outages within the state provides under the remedies implemented by the FERC in its December 15, 2000 order.

This experience with planned and unplanned outages does not appear to be isolated to just the California market. An increased amount of generation unit outages has also occurred in the New England electricity market. A recent study prepared for the Union of Concerned Scientists finds that the average amount of generating capacity out of service each weekday increased by 47 percent in the twelve months following the opening of the wholesale generation market, as compared to the twelve month period ending at the start of the market.

RESPONSE OF FERC TO EVIDENCE OF MARKET POWER

Despite its own conclusion that wholesale electricity prices in California are unjust and unreasonable and reflect the exercise of significant market power and the growing volume of evidence from a number of independent sources on the extent of market power exercised in the California electricity market, the FERC thus far has refused to set just and reasonable prices for wholesale electricity in California. Instead, as discussed above FERC implemented market rule changes that have enhanced the ability of these firms to set wholesale electricity prices that reflect the exercise of significant market power.

On April 26, 2001 FERC issued an order establishing a prospective mitigation and monitoring plan for the California wholesale electricity market that was implemented by the California ISO on May 29, 2001. This plan provides no guarantee that wholesale electricity prices will be just and reasonable during the summers of 2001 and 2002. This plan provides market price mitigation only under conditions of Stage 1, 2, and 3 emergencies but places no requirements on the bid prices of generators during other system conditions. Because of the requirement to limit bid prices during periods of system emergencies, the incentives for generators to supply as much capacity as possible are significantly dulled precisely at the time when this capacity is needed most. Consequently, it is highly likely that this aspect of FERC's market mitigation and monitoring plan will increase the likelihood of rolling blackouts during the summer of 2001.

The National Electricity Reliability Council's *2001 Summer Special Assessment* estimates that there will be 260 hours in which firm demand will be curtailed and that the average amount of curtailed will be about 2,150 MW. By dulling the incentives of suppliers to the California market to sell during these system conditions, FERC's remedy will most likely increase the number of hours of rolling blackouts and the magnitude of load that must be curtailed during these hours.

For many of the same reasons that the soft cap and other market rule changes implemented under the December 15, 2000 FERC order were ineffective at mitigating the significant market power exercised in the California electricity market from January 1, 2001 to the present time, the market rule changes implemented by FERC's recent prospective monitoring and mitigation plan are unlikely to mitigate the significant opportunities generation unit owners will have to exercise market power during the summer of 2001 and 2002. Because this plan provide price mitigation only during system emergencies it leaves unmitigated the vast majority hours that generation unit owners are

likely to exercise market power in the California market. Even when former soft-cap that was in effect, it provided limited protection the exercise of market power by requiring that a generator cost-justify any bid in excess of \$150/MWh.

The March 22, 2001 MSC report describes why this plan will not result in just and reasonable prices for California consumers from the summer of 2001 to the end of the summer of 2002. This report notes that the plan is likely to increase the frequency of rolling blackouts and the magnitude market power exercised during hours without Stage 1, 2, or 3 emergencies. In this way, California may get the worst of both worlds from FERC's market monitoring and mitigation plan—prices that reflect the exercise of significant market power during periods without system emergencies and an overall less reliable supply of electricity.

The expected result of FERC's the market monitoring and mitigation plan is exactly the opposite of that expected from the plan proposed in the December 1, 2000 MSC report and further elaborated on in the February 6, 2001 and March 22, 2001 MSC reports. This plan will limit the prices that consumers must pay for the vast majority of their wholesale electricity consumption over the next to years to prices that equal those that would occur in a market where no firms exercise their unilateral market power. Moreover, this market power mitigation plan would provide the maximum possible incentives for firms to keep their units operating for as many hours as possible during the summer of 2001. This plan also provides the strongest possible incentives for all firms to sell as much electricity as possible into the California ISO's real-time energy market during high demand and system emergency conditions.

THE OPPORTUNITY FOR IMMEDIATE FEDERAL RELIEF

Because several of the five new generation owners must apply for renewal of their market-based pricing authority before this summer, this presents an ideal opportunity for FERC to set just and reasonable prices for wholesale electricity in California. The evidence described above provides ample evidence that all of these market participants possess and continue to exercise market power in the California electricity market. This discussion has also shown that the attempts of the FERC to mitigate that market power with its orders over the past three years that the market has operated have failed to accomplish this goal. As discussed above, there is strong evidence that these remedies have in fact increased the ability of these generation unit owners to exercise market power. Rather than wait for the confirmation that FERC's most recent set of remedies will not limit the ability of

generation unit owners selling into the California electricity market, the most prudent course of action given the enormous potential economic and public health harm associated with the continued exercise of market power in the California wholesale electricity market is to implement a remedy that guarantees that California consumers will not be subject to wholesale electricity prices which reflect the exercise of market power.

The December 1, 2000 MSC report proposes such a remedy that does not impose a price cap on the spot market, but it does require FERC to intervene to make market rule changes that result in just and reasonable rates in California for the next two years. This plan would require all sellers in the California market during 1998 to 2001 (besides the three California investor-owned utilities) to continue to be eligible for market-based rates only if they offer 75% their expected annual sales in the form of two-year forward contracts at a price set equal to the average of perfectly competitive benchmark price over this time period. This is the market price that would prevail under the no market power standard explicitly stated in FERC's competitive market requirement for allowing a market participant to substitute market prices for cost-based prices. The potential upside profits for each market participant is still unbounded, because they have the opportunity to sell any remaining more energy beyond their forward contract commitment at market-based rates. However, because of the significant forward commitments all generators selling into California will have under this plan, the opportunities for these generators to exercise market power in the energy and ancillary services spot markets will be significantly reduced. The details of how each participant's contract quantity and price are set is outlined in the December 1, 2000 MSC Report. The February 6, 2001 MSC Report computed a just and reasonable price of \$54/MWh for these forward contracts for this two-year period using futures market gas prices at that time.

Any market participant that does not offer these two-year forward contracts would lose its market-based rate authority and be subject to cost-of-service rates for all of its sales of energy and ancillary services into the California market and surrounding markets in the Western US for at least this two-year period.

Once these forward contracts are in place, all price caps and bid caps (including the bid caps in FERC market mitigation plan implemented May 29, 2001) on the ISO's real time energy and ancillary services markets would be removed. All market participants still eligible for market-based prices will not be subject to bid caps or price caps in any of the ISO markets. This will maximize

the likelihood that sufficient generation capacity in the western US will be available to serve California's demand during all hours of the summers of 2001 and 2002. Moreover, because all California market participants will face a significant risk of having to purchase out of a potentially very high-priced spot market to fulfill their forward market commitment in the event that they do not have sufficient generating capacity available to meet their forward energy commitments, these firms will have very strong incentives to maintain their equipment in top working order.

All market participants with capacity located in California, including those subject to cost-based rates, would be subject to the following availability standard. All generators would be required to submit on an annual basis planned outage schedules. These would be reviewed by and approved by the California ISO. At all times besides those previously scheduled with the ISO, all generation units would be required to submit standing bids into the ISO's real-time energy market for the difference between the unit's nameplate capacity and its final energy schedule at whatever price the owner chooses. If a unit owner's bid is selected and it is unable to respond to the ISO's dispatch instruction, either with its own unit or some other unit in the same local area, the unit owner will be required to purchase this quantity of energy from the real-time energy market at the current market price. This availability standard effectively assigns the risk of forced outages to the unit owner, rather than the ISO.

With 75% percent of the expected sales of all market participants locked-in for the next to years at a price in the neighborhood of \$60/MWh and 100% of the expected production from the assets of the three investor-owned utilities available at production cost, California will have wholesale price certainly for between 80 and 85 percent of expected electricity consumption over the next two years at a wholesale price of less than \$65/MWh.

California can allow prices in a significantly smaller spot market to rise to the point necessary to attract sufficient supply into state to avoid rolling blackouts and to provide the necessary signals to final demand to cut back during high-priced periods. In order to provide signals to final demand to cut back during these high-priced periods, California should give all customer classes the right to purchase 85% of their 2000 demand each month or hour (depending on the time interval at which that customer's load is metered) at the 2000 retail price. Any additional purchases in that month or hour would be made that the wholesale price for that month or hour (depending on the time interval at which that customer's load is metered) plus the associated transmission, distribution and supply charges. Any reduction in consumption below this 85% of 2000 demand baseline would be refunded at wholesale price for that month or hour plus the associated transmission, distribution and supply charges. Given the existence of the forward contracts at the price discussed above and the supply of the output of the investor-owned utilities at production costs, this plan should not require the state to spend any tax revenues purchasing power for California consumers.

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- "Reliability Must-Run Contracts for the California Electricity Market," April 2, 1999.
- "Report on the Redesign of the California Real-Time Energy and Ancillary Services Markets," October 18, 1999.
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**TESTIMONY OF
THE HONORABLE GRAY DAVIS
GOVERNOR OF CALIFORNIA**

**BEFORE THE
SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS
JUNE 20, 2001**

Mr. Chairman, Ranking Member Thompson and Members of the Committee, thank you for inviting me here today.

I am truly honored to come before the Governmental Affairs Committee – a panel with a long and distinguished history of protecting the interests of the public. It is quite fitting that you are holding this very timely hearing on the role of the Federal Energy Regulatory Commission (FERC) in responding to the energy crisis in California and the West.

This morning, I want to provide a comprehensive overview of what the State of California is doing to take control of our energy future. In doing so, I hope to impress upon the Committee why I have been so adamant about the need for the federal government to play its appropriate role with respect to our energy crisis.

But before I proceed, I would like to make two brief points regarding the events of the past 48 hours.

First, the decision by FERC on Monday evening to expand its original price mitigation plan has altered the landscape. After having spent the better part of the past 12 months urging and pleading FERC to grant meaningful price relief from out of control wholesale energy rates, I am grateful that FERC is moving in the right direction. I will reserve more detailed comments on this subject and share some of my concerns over various aspects of the order later.

Second, in light of Monday's action, the real test centers on FERC's willingness to carry out and enforce the order in a vigilant manner. That is where your Committee comes into the picture. It is my strong hope that the Committee will continue to carefully watch the actions of FERC in the days and weeks ahead and take any necessary steps to ensure that FERC is properly enforcing the terms of its order.

Mr. Chairman, as I have emphasized repeatedly over the past several months, we are meeting the energy challenge head-on by embarking on an aggressive, all-out strategy. The State of California is fighting the energy crisis on several simultaneous fronts: generation, conservation, and stabilization. I'd like to briefly elaborate on each of these areas.

GENERATION

We are determined to move toward greater energy independence. The best long-term solution to California's energy mess can be summed up in two words: more power. To get it, we have to build it.

During the 12 years before I took office – from 1986 to 1998 – not a single major power plant was built in our state. Not one. During this period of time, California's economy grew by 93 percent. Our population increased by six million.

But beginning in April 1999, my Administration took steps to reverse this trend by moving plants online at a rapid pace.

We cut approval times in half and licensed 16 major power plants. Ten are under construction as we speak. Four will be online this summer. The first will be open a week from today, two more by July 7th, totaling more than 1,200 megawatts of power. We've also approved 10 new "peaker" plants, for another 876 megawatts.

The combination of these new power plants, with additional renewables, distributed generation, and re-rates of existing power

plants, will bring us closer to 4,000 new megawatts online by the end of September.

At no other time in the history of California have so many new power plants been under construction and in the pipeline.

I have also signed legislation establishing the California Public Power Authority to build, own and operate new power plants on behalf of consumers.

The Authority will supplement – not supplant – our existing network of privately owned plants. If the private sector won't build all the power we need to stabilize the energy market, then we will build it ourselves.

I am proud to say that we're accomplishing these goals without weakening our historic commitment to clean air and water. The bottom line is that we are working tirelessly and moving with a real sense of urgency to build new generation facilities in California. And we are clearly seeing the results.

CONSERVATION

Mr. Chairman, we have a great story to tell on conservation. California is now the most energy efficient state in the nation. We

use less electricity per capita than any other state – in fact, 42% less than the national average.

But we are not about to rest on our laurels. Several months ago, I signed an \$850 million conservation program into law. It's the most sweeping conservation effort ever undertaken by a single state.

It includes:

- Rebates for energy-efficient appliances and air conditioners;
- State-of-the-art, high-efficiency lighting;
- Home weatherization assistance;
- Real-time or time-of-use meters; and
- Peak load reduction incentives for agriculture and industry.

We've also launched a \$35 million media campaign called "Flex Your Power", which is already demonstrating positive results.

I've signed an Executive Order, offering a 20 percent rebate to consumers and businesses that conserve 20 percent during this year's summer months.

All across our state, consumers and businesses are answering the call of conservation, reducing their electricity use and, thus, our dependence on out-of-state power.

Earlier this year, I asked all Californians to reduce their energy usage by 10%. And to their credit, Californians have responded in a big way. In February, California businesses and consumers reduced energy consumption by 8%. In March, the reduction was 9.2%. For the month of April, we saved 9%. And in May, we made it all the way to 11%. The 11% savings would provide enough electricity to power the entire service area of San Diego Gas and Electric at peak demand times. These figures show that Californians fully understand what is at stake. They are making heroic efforts to cut back.

I am proud to say that California's business community has stepped forward and joined us in an exciting new conservation partnership. Nearly 140 businesses and organizations – ranging from Bank of America to Pacific Bell to Hilton Hotels -- have committed to reduce their energy use by 20 percent. This is the biggest conservation commitment ever made by the California business community.

State government is leading by example. Energy use in state office buildings has dropped by as much as 25%.

Local governments are also getting into the act. 225 cities, counties and special districts throughout the state signed energy conservation agreements with us.

A partnership between the State, Commercial Building Owners, and the Service Employees International Union has produced a plan to reduce energy use by 10 percent in some 300 million square feet of office space.

It goes without saying that conservation goes hand in hand with energy efficiency. In this regard, California is a world leader.

For example, we are pioneering the use of light-emitting diodes (LED) in traffic signals. These use 75 percent less power than conventional traffic lights.

Through our "Powerwalk" Program, members of the California Conservation Corps are distributing 1.5 million compact fluorescent light bulbs door-to-door. These bulbs will save enough electricity to power 100,000 homes.

In short, California's aggressive conservation efforts are paying off. Businesses, homeowners, consumers, and state and

local governments are heavily engaged in this massive effort. We expect to see even more positive results in the months ahead.

STABILIZATION

In addition to meeting the challenge of supply and demand, we are also doing everything we can to bring stability to the situation.

On January 17, the State of California stepped in to purchase the power the utilities could no longer afford to purchase. By doing so, we were able to keep the power on and the economy growing.

Since then, we have moved aggressively to lock up a portfolio of long-term power, which in turn has significantly reduced our reliance on the volatile spot market.

Our emphasis on long-term contracts has played a major role in pushing prices downward, especially in the last few weeks. But I would argue that these prices are still far from reasonable.

In addition to long-term contracts, stabilizing the energy market also requires that our utilities remain viable. Towards that end, we have worked hard to restore the utilities to financial stability, provided they agree to meet three conditions:

- They must provide low-cost regulated power to the state for 10 years;
- They must sell their transmission lines to the state;
- They must dismiss their lawsuits seeking to drive up rates.

On April 9, I announced a Memorandum of Understanding with Southern California Edison on the key principles of a balanced recovery agreement.

Just last week, an agreement between Edison and the state's "Qualifying Facilities" was reached that will increase supply and bring online those plants that were off line for economic reasons. It is estimated that this agreement will save the state \$100 million by the end of this year.

Two days ago, we announced an agreement with San Diego Gas & Electric. In this case, the state was able to negotiate a \$747 million balloon payment owed by San Diego ratepayers down to zero, with no increase in rates.

CALIFORNIA'S ELECTRICITY MARKET

In the summer of 2000, California's experiment with electricity deregulation began to unravel in a dramatic way. Unprecedented wholesale electricity prices became the norm in the "market", and these exorbitant prices have continued to this day.

In 1999, total energy costs in California were \$7 billion. In 2000, we paid \$27.1 billion. In 2001, total spending is projected to be anywhere from \$35 to \$60 billion, despite the fact we are using less electricity. In the first quarter of this year, we spent a total of \$10.6 billion, compared to \$1.7 billion during the first quarter of 2000.

By any measure, we have a wholesale energy market that is not working. The California market is not competitive, it is not reasonable, and certainly not just.

Mr. Chairman, no one is more pleased than I am to see the drop in these outrageous prices over the past few weeks. This positive trend is the result of various factors: cooler weather; less reliance on the volatile spot market thanks to long-term contracts; a downward spike in natural gas prices; more generation coming back on line from maintenance; decreased demand due to conservation;

and increased scrutiny of the generators' pricing practices by lawmakers and the media.

At the same time, however, I would strongly urge everyone not to be lulled into complacency over recent price decreases. Make no mistake, prices will rise again – when the weather heats up or when the power companies figure out another way to game the system. The fact remains that even with recent moderation, electricity prices remain subject to a number of variables at play in a dysfunctional wholesale market.

These wholesale prices have produced enormous profits for mostly out-of-state generators. Economists and our own ISO have found that these generators are exercising significant market power, raising prices to well above where they reasonably should be in a functioning competitive market.

As the Committee heard last week, several independent economists have documented that out-of-state generators like Williams, Duke, Dynegy, Reliant and Mirant are exercising market power in California to raise electricity prices well in excess of typical levels in a fully competitive market.

FERC ROLE AND OBLIGATION

Mr. Chairman, we have clearly demonstrated that we can build supply and conserve unprecedented numbers of megawatts – but only the federal government has the power to ensure a just and reasonable wholesale electricity market in California.

This is not a matter of discretion for federal regulators. It is an obligation under law. Under the Federal Power Act passed by Congress in 1935, FERC is required to ensure that wholesale electricity prices are “just and reasonable”. If prices are not “just and reasonable”, they are unlawful and the Commission must act to control prices. They must then order refunds for prices in excess of just and reasonable levels.

URGING FERC TO ACT

From July 2000 to today, I have pressed federal regulators in every way possible to take immediate steps to control runaway wholesale prices. I called on then-President Clinton to urge his FERC to take desperately needed action, just as I have called on President Bush to do the same. I have submitted statements to FERC. I have testified before FERC. In addition, through the

Electricity Oversight Board, the Public Utilities Commission and ISO, the state has formally filed with FERC for relief from these unlawful prices beginning in August 2000. Collectively, we have submitted over 100 filings to FERC seeking relief.

We sought hard price caps. When that failed, Governor Locke, Governor Kitzhaber and I proposed temporary cost-based pricing. We have requested refunds when warranted. And we have asked FERC to deny AES, Williams, Duke, Dynegy, Mirant and Reliant the ability to charge market rates in our market which FERC itself has found to be dysfunctional.

Unfortunately, despite these pleas, at almost every point where FERC could have acted to control wholesale prices, it failed to do so.

FERC RECOGNIZES UNJUST AND UNREASONABLE PRICES

On November 1, 2000, FERC concluded that wholesale electricity prices in California were unjust and unreasonable. The Commission reaffirmed this finding on December 15, 2000. In March of this year, FERC again determined that wholesale prices for some power purchased in California were not just and reasonable and ordered very limited potential refunds as a result. And in April, the

Commission found once again that California had a “dysfunctional market”. As Commissioner Massey wrote in his April 26 dissent, “Prices are not just and reasonable now and will not be this summer and the economic carnage is spreading throughout the western interconnection.”

ATTEMPTS AT IMPOSING PRICE RELIEF

FERC’s first attempt to address the collapse of our electricity market came on December 15, 2000. Ignoring warnings that their plan would actually lead to higher wholesale prices, FERC implemented a “soft price cap” proposal that permitted generators to be paid as bid above a soft cap price set at \$150. After the fact, FERC could review and adjust the price downward.

California opposed this mechanism on grounds that it would not restore reasonable prices. Instead, we believed it would lead to higher energy costs and exacerbate supply problems. Not surprisingly, sellers generally chose to demand very high prices and report them to FERC in the hope that FERC would not act.

This is precisely what happened; costs continued to escalate out of control. The average price in January 2001 was \$317 per

megawatt hour – well above the \$150 so-called cap. Moreover, during January when demand for electricity is typically low, we experienced almost daily Stage 3 emergencies and two days of rolling blackouts.

Recognizing that its December order was ineffective, FERC adopted yet another inadequate scheme on April 26, 2001. This plan applied only during limited emergency conditions despite clear evidence that high prices prevail during non-emergency conditions – 24 hours a day, seven days a week. FERC ordered the plan in place for too short a duration – only until May 29, 2002 – thereby leaving the state without protection next summer during peak energy usage.

The April mitigation order did not apply across all markets. It applied only to the ISO's real time markets, which constitute only about 3.5 percent of the short-term energy purchases in California. Once again, under the April plan, sellers were not held to a proxy price. Generators were free to charge in excess of the mitigated price and then submit a justification later. We pay the higher price and affirmative steps must be taken to ensure that any unwarranted excess is refunded.

FERC's April order allowed the least efficient, most costly plants to set the price for all sellers. It established a market clearing proxy price based on the highest cost plants in the state. All sellers are paid this price despite their lower costs and lower bids.

In perhaps the biggest loophole, the Commission failed to remedy against megawatt laundering. Under the April order, in-state generators were free to export electricity and then out-of-state companies could have resold that same electricity to California at much higher prices. This is because imports were not subject to price mitigation.

As FERC proposed a series of patchwork remedies, we have consistently called for a temporary, reasonable and results-oriented solution. Governor Locke, Governor Kitzhaber and I have advocated price relief in the form of cost-plus pricing. We have urged FERC to adopt price relief that (1) would be temporary in nature, (2) would allow generators to recover their costs plus a reasonable profit and (3) would not apply to new power plants.

This approach has garnered the support of prominent economists from around the country, including those who have argued against price caps in the past.

This proposal is also similar to the legislation put forward by Senator Feinstein and Senator Smith, which, Mr. Chairman, you are co-sponsoring. The people of California and I are very grateful to both Senator Feinstein and Senator Boxer for their strong efforts to achieve real price relief.

My fellow Californians in the House of Representatives have been just as forceful in their efforts. A majority of our delegation has rallied around legislation introduced by Representative Jay Inslee to ensure cost-of-service-based rates in the West. This legislation is now the subject of a discharge petition in the House. Through the introduction of legislation and hearings such as this one, the Congress is shining a light on FERC that it clearly has not ignored.

FERC'S ACTIONS FALL SHORT

Even with its own admission that California's electricity market is dysfunctional, FERC consistently refused to set just and reasonable prices. It chose instead to impose two different ill-considered mitigation schemes.

Monday's action by the Commission confirms what I have been emphasizing – namely, that FERC had not fulfilled its legal obligation

to ensure just and reasonable prices. While I believe that FERC took an important step forward on Monday, the FERC's ineffectual actions at price mitigation up to this time have resulted in massive overcharges to the people of California.

THE CASE FOR REFUNDS

In March, ISO's Department of Market Analysis estimated that from May 2000 to February 2001, total costs in California's wholesale market exceeded reasonable competitive market levels by as much as \$6.7 billion. Extending the analysis through May 2001, we now have a potential overcharge of approximately \$8.9 billion.

To date, FERC has identified potential refunds of only \$125 million, 1.4% of the total potential overcharge identified by our ISO.

FERC has not ordered any refunds to be paid.

FERC will not even consider refunds prior to October 2000; it has refused to order refunds for the period between October and December 2000; and it has limited refunds to gains made only during Stage 3 emergencies.

Excessive profits above just and reasonable levels were allowed during all other hours.

The effect of this arbitrary limitation can be seen most vividly in FERC's conclusion that no potential refunds were due during the month of April. This determination was made not because charges were reasonable, but simply because there were no Stage 3 emergencies.

We have put before FERC compelling evidence of overcharges by generators selling electricity to our state over the last year. FERC must move quickly to enforce the law and order the energy companies to give back the money.

THE NEED FOR RELIEF FROM NATURAL GAS PRICES

FERC must also give careful scrutiny to the problem of natural gas prices. High natural gas prices – which have been disproportionately higher in California than other states – are linked inextricably to our high cost of electricity.

As recently as three weeks ago, California natural gas prices were two to three times higher than the national average. And at times this year, the price in California has exceeded eight times the national average.

As with electricity, FERC has the responsibility to control the exercise of market power and excessive pricing in natural gas markets. FERC has yet to take definitive action.

As I mentioned, California's energy woes have been compounded by the unacceptable disparity between our rates for natural gas and that of the rest of the nation.

This huge discrepancy is a result of the high cost and insufficient availability of pipeline capacity to and within California. As we now know, one company, El Paso Corporation, along with its affiliate, was able to control a significant portion of one pipeline into Southern California.

The California PUC filed a complaint against El Paso in April 2000. FERC was slow to act on these allegations of anti-competitive behavior. I credit Commissioner Wood for recognizing this delay, which occurred before he joined the Commission.

In the El Paso case, FERC can demonstrate that it stands on the side of consumers against energy extortionists. I remain cautiously optimistic that they will take advantage of this opportunity.

FERC's obligations regarding natural gas extend even further.

After failing to respond for over five months to a complaint regarding high natural gas prices in California, FERC has finally asked for comment on whether it should re-impose the maximum rate ceiling on short-term capacity release transactions into California.

The answer is a resounding "yes."

Lifting the price cap for short-term releases of capacity was a failed experiment. The time has come to reverse that mistake and move on.

However, re-imposition of this price cap will not completely solve the problem of California's dramatically higher natural gas prices compared to the rest of the country. I continue to urge FERC to investigate and act to bring California's gas prices in line with national prices.

JUNE 18, 2001 FERC ORDER

I am gratified that after a year of pounding at FERC's door, the Commission has opened up and issued an order that is a positive step forward by providing some price relief. The FERC did correct the most obvious flaws in its April order, providing mitigation that covers all hours and the entire Western interconnect. While I am

cautiously optimistic that the latest order will help to keep prices down in the spot market, there a number of things FERC could have done better.

FERC insists on tying its price formula for wholesale electricity to the costs of the least efficient and most expensive generator. Using a cost-of-service-based rate, as championed by Commissioner Massey, would have been far preferable, and far more equitable than what FERC has settled on. The use of the least efficient generator may well result in the greater use of inefficient generation to encourage higher prices. In addition, while the Commission has altered the formula to provide a better gage of costs of generation, they undo that by slapping on a ten percent credit-worthiness surcharge.

The FERC order does not address the wildly fluctuating natural gas market, which has created the severe disparities in the price of natural gas bought at California's borders. Because of the close relationship between the price of gas and the costs of generation, the success of the June 18 order is tied to the continued moderation of prices in the natural gas market. The Commission needs to be

vigilant about ensuring that we in California are not subject to continued exorbitant transportation costs for our gas supplies.

Finally, FERC continues to leave the question of refunds wide open, with little or no guidance on the process by which we in California can be made whole after months of paying unjust and unreasonable prices. FERC should exert its authority and order these refunds. We have been waiting for months for the Commission to exercise its responsibility to refund California ratepayers for the wholesale costs of electricity that the Commission itself has failed to control. In this respect, the Commission has a long way to go to finish its job.

CONCLUSION

Mr. Chairman, this Committee can play an essential role in ensuring that FERC's June 18 order is implemented in a manner that ensures true price mitigation of electricity costs in the West. I am hopeful that FERC will be vigilant in implementing its new order. As we cautiously and optimistically wait to see the impacts in the market, Californians will continue to demand that FERC exert its role to refund the unjust and unreasonable costs of electricity that the state so clearly is owed.

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We have made some progress on prospective price relief. Now it's time to move forward on refunds.

Thank you for the opportunity to come before you today. I look forward to answering any questions you may have.

Testimony of
Christine O. Gregoire
Attorney General of the State of Washington
Before the
Committee on Governmental Affairs
United States Senate
June 20, 2001

Introduction

Good morning. I thank Senator Lieberman and the members of this Committee for holding this timely and important hearing and for inviting me to testify.

As Washington's Attorney General, I have several roles relevant to the subject of this hearing.

- I am here because this is an issue which has deeply impacted the citizens of my state and its economy and I am very concerned that we, and other western states, have been the victims of unlawful antitrust or unfair business practices.
- My Office also has a statutory role as "Public Counsel" -- an advocate for consumers and small business utility ratepayers in regulatory proceedings before the Washington Utilities and Transportation Commission and in disputes with the federal government. As such, we have already submitted comments to the Federal Energy Regulatory Commission (FERC) in response to its April 26 Order.
- My Office is a statutory public advocate for the environment, and we monitor the delicate balance between our natural resources and our state's energy needs.
- Finally, we provide counsel to Washington's Utilities and Transportation Commission. That Commission also filed comments before FERC in response to its April 26 Order and in numerous other proceedings.

This morning, I speak to you in all of these capacities. And I speak as well for my colleagues in California and Oregon who have joined me in the multistate law enforcement investigation that I will describe shortly.

The Impact Of The Energy Crisis On The West

This is a west-wide crisis, and I am happy to see that, after a year of extraordinarily high prices in the west-wide wholesale market, FERC has recognized it as such.

This crisis is not just about legal proceedings and economic theory. It is about real people in the Pacific Northwest who have been adversely impacted in a variety of ways. What impact have these problems had on the people of Washington?

Our utilities, especially our publicly-owned utilities, have paid hundreds of millions of dollars for power. For example, Seattle City Light has paid \$312 million to buy power on the open market in the last year, compared to a normal year in which it spends \$50 million. Seattle consumers' rates were raised by 42% since January, and they expect another rate increase in October of up to 22%. Snohomish County Public Utility District (serving the Everett area) went through its entire \$30 million reserve fund within one week and also had to increase rates 35%, with more increases expected in the fall. Both of these utilities had to issue new bonds to cover this unexpected debt.

These increased costs reverberate through the economy and society. Schools must divert funds from needed educational programs to purchase power, and we have idled or shutdown major industries. Georgia-Pacific shut down its Bellingham plant and idled 420 workers, citing power costs as a reason. Because prices have been so high, it is cheaper for the Bonneville Power Administration to buy back power from its aluminum company customers than to serve them.

And we are experiencing these results despite Herculean efforts on the part of our utilities and public officials to promote energy efficiency. In Washington, Governor Locke and the Commissioners of our Utilities and Transportation Commission have been taking a leadership role in asking our citizens and businesses to implement energy efficiency measures. Washington State has a strong conservation ethic, and we would like that ethic to be a national one. It can reduce the demand for electricity and thereby cut costs to help the economy. And it will help the environment in the process.

The Multistate Antitrust Investigation

The Attorneys General of California, Washington and Oregon have launched a multistate law enforcement investigation into the causes of the exorbitant prices charged to companies and public utilities serving west coast consumers. The phenomena in the wholesale market since June 2000 do not appear to be the function of natural market forces, and this energy crisis has severely impacted the citizens of our states.

What raises our concerns? In the past year we have seen:

- Wholesale market rates for a megawatt-hour of electricity skyrocket from \$30 to \$300, even up to \$3,000 at times during the past year. What caused these sudden, massive price hikes? Was it natural market forces or some form of unfair business practice or collusive activity?
- Sudden, unplanned maintenance outages at generating plants in California, to the point where 40% or more of the generation capacity has been consistently offline, compared to historical averages of under 10%. What caused so many competing generating plants to suddenly go offline at the same time? Was it due to valid maintenance problems or some concerted effort to reduce capacity?
- Prices remaining high 24 hours a day, even though power is being purchased for offpeak hours. Why can prices stay so high when demand is reduced? Is it a normal market response, or due to some agreement not to lower prices?
- Transmission capacity restraints during crucial times, further exacerbating high prices and availability of power. What caused these constraints? Were the companies exchanging confidential data in a joint effort to create transmission problems?
- Suspicious activity in the California natural gas market, including claims that companies may have collusively agreed to suppress construction projects, or may have engaged in other practices designed to favor their affiliates. Were these problems the result of collusion or attempts to monopolize the pipeline market?

Together, the Attorneys General are seeking an explanation for why these things occurred. If we find evidence of violations of the state or federal antitrust, unfair business practices, or criminal laws, we will take the companies, and any culpable individuals, to court and seek the maximum penalties. In Washington, we would ask for monetary payments from the power companies and the maximum amount of civil penalties allowable by law, which in Washington state is a half million dollars per company per violation and one hundred thousand dollars per person per violation. In California, a criminal grand jury is also being convened in early July to determine if criminal activity took place. That grand jury will be exploring state RICO or other criminal violations, including false claims under California law.

Let me note something else about our investigation. We have received tremendous cooperation from our local utilities, the California ISO, and relevant trade organizations. In sharp contrast, we are having difficulty getting access to

the power generators' records. California issued civil investigative demands (CIDs) in February. It is now June, and the states still do not have the documents we requested. The companies objected to turning over most of their documents, and they refused to authorize other Attorneys General to look at their records. The Attorney General of California was forced to go to court to seek an order directing the companies to turn over the documents. We await the court's order. The companies also refused to let the California Attorney General share the documents with other state agencies, despite his statutory right to do so. These companies apparently did not want the states to work together on the investigation and didn't even want California agencies to work together.

So, Oregon and Washington have issued separate CIDs for these records, and we will go to court in Washington State if necessary to enforce our subpoenas. Some of the generators are still resisting. They insist that have not done anything wrong, yet they won't cooperate. Incredibly, some claim there is no relationship between anything they may have done in California and the prices of energy the Pacific Northwest utilities paid on the open market, or that we don't have authority to investigate! Clearly these companies are willing to deny the very fact that our western energy market is interrelated, something everyone else in the country acknowledges.

Let me cite you an example. One of the generators, Duke, at its request, came to visit both me and Oregon Attorney General Myers in our respective offices a week before we issued our CIDs. At that meeting the attorney pledged cooperation and purported to speak on Duke's behalf. Only a few days later, he refused to accept service. In California, Duke proposed a settlement to resolve the dispute. However, Duke specifically conditioned the settlement on ending the antitrust investigation.

Two other generators, Reliant and Mirant, were also served with CIDs. When first contacted by my staff for its response, Reliant's attorney told us he couldn't even talk to us. When we finally got through to someone who would talk to us, he said Reliant's business has nothing to do with Washington, even though he admitted Reliant makes sales to our purchasers. Similarly, Mirant is apparently also contesting our ability to investigate.

My question for the companies is: What do you have to hide? If you haven't done anything wrong, let us see your records on an unconditional basis, in a way that's timely and responsive to our question. Let the truth be the judge.

Additionally, all three states will be issuing requests to important traders very soon. We hope that we can get assurances of their cooperation up front. However, we are also aware that Enron tried to walk away from some of its long term contracts with California schools and the schools were forced to bring legal action to achieve relief.

At the same time that we are pursuing our antitrust investigation; however, we are also realistic. Unfortunately, such law enforcement investigations often take months, if not years, to complete, and it only works in the generators' favor to delay matters further. This power crisis began in June of 2000, and the western states have suffered tremendous harm. Yet, it is unlikely that we can achieve a remedy through the courts under the antitrust laws anytime soon. (For example it took us four years to investigate and litigate the *Tobacco* lawsuit; it took us seventeen to sue and settle with the oil companies in the *Petroleum Products* case.)

Nevertheless, we will diligently pursue this matter on behalf of our citizens and we will do so until we are satisfied that we know the truth. In the meantime, we will also pursue every other available remedy allowed under state or federal law.

Protecting Ratepayers – FERC's Obligation

Let me now turn to my role as Public Counsel for the ratepayers of the Washington State. The energy issues facing the Congress and FERC are complex. But amidst the complexities is a simple, straightforward principle: FERC has a statutory duty to ensure that rates in the wholesale market are "just and reasonable." Historically, "just and reasonable" rates were ensured by setting rates based on costs. If the seller's costs increased, then FERC authorized higher rates; if costs decreased, then FERC required (and was obligated to require) lower rates.

In recent years, FERC implemented "market-based" rates based upon a presumption that such rates would increase efficiency in the production of electricity and ultimately lower the cost of electricity to the consumer. FERC determined that market forces can provide ratepayer protection as well as cost-based rates. And if, as has been the case, the "market" does not ensure "just and reasonable" rates, then FERC has a statutory *duty* to either revert to cost-based pricing or to establish safeguards so that the "just and reasonable" standard is met. It may not, I submit, just sit and wait for the broken market to right itself.

Though I am disappointed that FERC did not act earlier to address the problem on a west-wide basis, I am pleased that it has now expanded its most recent Order to provide relief west-wide and to spot market sales of electricity 24 hours per day, 7 days per week--- not just during times of reserve emergencies. It also extended the "must-offer" provisions of its mitigation plan to the WSCC but, importantly, continued its exemption for hydroelectric power. It is a step in the right direction. However, I still remain concerned that the Order will not provide adequate remedies for all the harm my state has suffered, and I will want to see if it will address the problems prospectively.

For today, my most important point is that the effectiveness of this Order must be monitored very carefully. I cannot say today whether the remedies it

contains will or will not satisfy FERC's statutory duties to provide "just and reasonable" rates. If rates are not reasonable, then FERC must revise its remedies – immediately. Our consumers of electricity cannot afford further delays in obtaining just and reasonable rates to which they are entitled. Our economy, and our environment, should not suffer further.

So, this Committee must look ahead to implementation of this Order over the next weeks and months, and also ahead to the market beyond the life of this Order – after summer 2002. In the past decade, FERC's role has shifted from a setter of rates to an enforcer of marketplace rules. As we know from other federal and state agencies that enforce marketplace rules, this is a resource-intensive task, and this Committee should make sure FERC has the necessary resources to do the job.

In addition to looking ahead, this Committee must look backward as well. In its June 19 Order, FERC initiated a process that would allow refunds for sales at unjust or unreasonable rates into California, but no such process that could result in refunds for the rest of west. But FERC has acknowledged that there is one market west-wide. The prices on a given day in California tracked the prices on that same day in the Pacific Northwest. Under the FERC Order, it is possible that there would be a refund associated with a sale of a \$500 megawatt hour of electricity to San Diego, but no refund associated with a sale of one megawatt that same day, at the same price, by the same seller, to Seattle. Apparently, this anomaly is based on the fact that, despite numerous requests, FERC did not initiate the west-wide investigation until April 26, post-dating the California investigation by a number of months. But such unequal treatment of customers, and regions, should not be a function of FERC's inaction in opening the west-wide docket.

Consumers west-wide must be made whole. That is the thrust of our multistate law enforcement investigation, and it should be the work of FERC as well. And because such law enforcement cases often take years, I urge FERC to ensure that past market injustices are remedied for all customers throughout the west. We look to this Committee for assistance in persuading FERC and, if necessary, for any requisite corrective legislation.

In summary, let me encourage this Committee in its oversight role to:

- Monitor carefully the implementation of FERC's Order. Judge its effectiveness by FERC's statutory duty – to ensure just and reasonable rates.
- Ensure FERC has the resources and guidance to monitor and investigate rates that may be unreasonable, to enforce its Order and any subsequent orders designed to make markets work, and to provide refunds to make all consumers whole.

- Make sure that there is a long-term solution to our energy problems. This Order expires in summer 2002. We need to ensure that the energy policy at that time will ensure just and reasonable rates.
- If this Order does not appear to be working, FERC must take immediate, decisive, corrective steps to ensure that rates are just and reasonable.

Protection of Our Environment

In addition to protecting ratepayers, FERC must be vigilant to make sure that energy efficiency and protection of the environment are essential parts of any solution, both long-term and short-term.

Because of some unique factors in the Northwest, the high cost of power impacts sectors of the economy in other ways. Washington, like other northwest states, is uniquely dependent on hydroelectric power. Approximately 80% of Washington's locally generated power is from hydropower. In a normal rain year, supplying our local needs would not be a problem. But this year, we are experiencing a water shortage; a drought. Rainfall is the lowest in 20 years. The combination of low rainfall and earlier than normal snow melt mean that we may face critical shortages in the late summer and early fall.

The high cost of power has placed additional demands on the Columbia River system to generate power, sometimes to the detriment of the competing demands for that water. Irrigators, industries, and cities have had to live with less this year, with disproportionate impacts on our agricultural communities.

And, of course, one cannot discuss the Columbia River without discussing fish. Salmon are a critically important part of native ecosystems and the culture of Washington State, especially to the Native Americans, whose culture and economy are strongly connected to the salmon.

But our salmon are in real trouble. The American Fisheries Society has identified 214 native naturally spawning pacific salmon in western states that are at serious risk -- 67 of these stocks are in the Columbia and Snake River Basin. The continued survival of these salmon is inextricably linked to the hydroelectric power system.

Under the best of circumstances, the operation of the Columbia River power system exacts a significant toll on the salmon. Water used for electric generation has a major impact on fish mortality. In the absence of less harmful alternatives, we are left to balance the utility of the system against the harm to the species. We, as a state and a nation, adopt laws, such as the Endangered Species Act, that are reflective of the balances we have struck.

As our hydro system is stretched for every available kilowatt, the salmon in the Columbia River face increasing challenges. These challenges implicate state and federal legal obligations under laws such as the Endangered Species Act, test the balances that we have reached, and challenge the veracity of the information we relied upon in reaching those balances. We in Washington State are stepping up our efforts to conserve energy and protect salmon. At the same time, we must be assured that the challenges to the hydropower system and the threats to our salmon are not exacerbated by artificially driven manipulations of flow and power generation.

So, I want to remind this Committee that these issues, these "antitrust" and "FERC issues," are not just about legalities and about economic theories of competition. They implicate the day-to-day lives of our citizens, our businesses, our schools, and our environment. As we move forward, we must keep these interests – truly the public interest in the broad sense of the word – in mind.

Conclusion

This energy crisis has had a tremendous impact on my state's citizens, businesses, economy, and environment. It is a west-wide problem. Although we will continue with our law enforcement review, FERC is uniquely situated to monitor this energy market and provide appropriate remedies to all who have been harmed by unjust and unreasonable rates. We ask this Committee to make sure that, in the end, FERC fulfills its mandate that energy rates be "just and reasonable."

Thank you again for the opportunity to appear before this Committee.

**TESTIMONY OF ROY HEMMINGWAY
CHAIRMAN, OREGON PUBLIC UTILITY COMMISSION**

**Before the
SENATE GOVERNMENTAL AFFAIRS COMMITTEE**

JUNE 20, 2001

I appreciate the opportunity to offer my perspectives on the role of the Federal Energy Regulatory Commission (FERC) and, specifically, its response to the Western power crisis.

I am speaking here today in my role as Chairman of the Oregon Public Utility Commission, but I want to note that my views are shared by Governor Kitzhaber, who has taken leadership on these issues since last fall.

During the last year we have seen a national experiment in energy deregulation go drastically awry. The overseers of that experiment – The Federal Energy Regulatory Commission – have chosen to do little or nothing to avert the worst effects of this crisis. The results have been clear: one of the largest, oldest, most stable utilities in the nation driven to bankruptcy, utilities and governments shouldering massive debt to pay electricity bills, utilities and consumers throughout the West paying prices for electricity at many multiples of its cost of production, industries shut down because of high electricity prices, consumers having to go without the necessities of life, the environment being sacrificed for electricity production.

At the beginning, I want to make three points very clear. First, Oregon believes in competition and markets. Governmental regulation is a poor substitute for the natural regulatory mechanisms of the marketplace, when indeed there is a marketplace with competitive prices. Oregon has embarked on a gradual and flexible opening of retail markets for larger electricity customers, but even this approach is politically in trouble due to the chaos in the Western power market. While I speak, I do not know the fate of Oregon's restructuring effort in the Legislature, where there are significant efforts to delay or repeal the restructuring measure passed in 1999.

Second, Oregon believes in sending appropriate price signals to consumers. Utilities in Oregon and the Northwest have done just that, passing on the higher wholesale prices to retail customers. This crisis has not been brought

about by the failure to pass on higher prices, and it will not be alleviated except at great cost by doing so. As a regulator, the thought of passing on to consumers unjust and unreasonable wholesale prices is a task that I do not relish.

Third, Oregon does believe that there is a shortage of electricity in the West. Until recently, the West had experienced a surplus of electricity for well over a decade, and utilities and others were reluctant to build plants in this surplus environment. Despite Oregon's rather easy-to-navigate siting laws, we had few applications until last year. As in California, siting applications and construction have now increased dramatically, starting before wholesale prices were allowed to skyrocket. In Oregon, we have 1,500 megawatts under construction, 3,000 more megawatts in the siting process, and many more in the planning stage. This is in a state with average usage of 5,500 megawatts today, and 10,000 megawatts peak usage.

Much of the shortage of electricity would not have occurred if we had had abundant rainfall in the Pacific Northwest. Since the Northwest hydroelectric system alone produces up to 4,000 average megawatts more electricity when there is abundant precipitation than on average, precipitation plays a great role in electricity planning. Government does not build power plants. It is utilities and competitive enterprises that do so, and they will not build if they believe that they will be selling into a surplus environment. The potential for several good hydro years in a row and a resulting surplus, as we had up until last year, creates a very uncertain climate for investors in power plants, which federal and state regulators must take into account. When we have a drought condition, as we have had this year, there will be shortages in the West, even under conditions where we have adequate generating plants and fuel to run them.

I say all this to emphasize that we who advocate federal intervention in the Western power markets have been doing our part to augment supplies since before this crisis began. We are not against market competition in the electricity business, and we are not advocating repeal of the laws of supply and demand. We are simply asking that the federal government undertake its usual and accustomed role in regulating electricity marketplaces when they are characterized by high prices and inadequate numbers of competitive suppliers

The Federal Power Act was passed in 1935 to give to what is now FERC the power to set "just and reasonable" rates in the wholesale electricity market. Regulation of retail sales was left to the states. The Federal Power Act and the subsequent Energy Policy Act of 1992 were designed to prevent those with monopoly power from enforcing unjust prices in a non-competitive market.

Since last winter, the three West Coast governors have called on FERC to impose under the Federal Power Act cost-plus pricing or some other form of temporary price controls in the Western wholesale power markets. The concern of the states then, as now, is that the extraordinary wholesale prices our utilities, and government agencies, such as the Bonneville Power Administration, are paying to a handful of power marketers are threatening our state economies, straining household budgets, putting people out of work, and causing general business slowdown.

We have been told by the FERC majority that serious temporary price controls would not be imposed for three reasons. All of these reasons fail in analysis.

First, we have been told that wholesale price controls will work against bringing increased supply to the market. When making this argument, FERC seems to confuse long-term supply with the immediate need in the Western power market. As I indicated, Oregon and the other Western states have been stimulating investments in new supply, as well as in energy efficiency. There is no way, however, that the amount of supply that would create a truly competitive market can be built in time to significantly temper the prices utilities have been paying in the wholesale market today. The lead time is too long. The first of the new generation under construction in Oregon will come on line next month, and that plant was started over two years ago. Not enough generation is likely to be able to be brought on line this summer to alleviate the real and contrived shortages in the Western market. The high prices supported by FERC are simply not needed to stimulate investment in new generation.

Theoretically, high wholesale prices should stimulate suppliers in the short term to bring on generation that otherwise would not come to market. However, the prices necessary to support bringing on such generation at a profit are small percentages of the prices that have obtained in the Western power market in the last year. In truth, the unfettered wholesale market

avored by FERC has done little to increase supply. Over the last year, the California market in particular has been characterized by record levels of plant outages, despite stratospheric prices. How can anyone believe that these prices are stimulating supplies to be brought to the market when these plant outage rates prove otherwise? Instead, the high prices have had a perverse effect: owners of generation do not need to bring new supplies to the market in order to make record profits, which almost all of the energy suppliers in California have done. Without colluding, the energy suppliers can figure out that not bringing every kilowatt to the market will boost prices and create profits. Only as power prices have declined have we seen lower plant outage rates. Have these price declines been due to mild weather and market restructuring by the State of California? Or have they occurred because there has been a political shift of power in the nation's capital? Only further analysis will tell.

High prices can reflect scarcity of a good or they can reflect sheer market power by a few sellers. We do not need to decide which has caused the current crisis – I believe that they both have. The shortage has given incentive to suppliers not to have all their supplies ready to bring to market. Temporary price controls can eliminate incentive for the owners of existing generation to withhold supply from the market to maximize profits, while still giving all owners of generation a fair, if not handsome, return on investment.

Second, we have been told that temporary price controls will eliminate incentive to reduce demand. Prices at small fractions of what they have been in the Western market will work to reduce demand. In addition, when wholesale prices come closer to the real costs of new power supplies, consumers will have greater faith that these prices are here to stay and will make the investments necessary to reduce demand. But again, as with new power plants, new investments in energy efficiency take time. In Oregon, we are gearing up the programs to make those investments. Ironically the political instability caused by the electricity market failure threatens Oregon's source of funds to carry out energy efficiency investments, because they are tied to Oregon's own deregulation experiment now under political fire.

The Western electricity market crisis has produced the opposite of what is desirable for convincing consumers to make appropriate energy efficiency investments. Consumers need an understandable explanation for what is

happening and what the future is likely to be. With all the talk about whether the crisis is real or contrived, permanent or temporary, consumers will not make those investments. Instead, we are left with short-term demand curtailments, which can be effected through governmental and utility action. This has largely been accomplished through shutting down energy-consuming business, slowing the economy in our states.

Third, we are told that wholesale price controls will not be temporary. But with new generation being built all over the West, a truly competitive marketplace may possibly not be far off. With a normal water year next winter in the Northwest, controls could come off by next summer. We seek rate stability until power supplies increase and functioning market conditions prevail, and no longer.

FERC's response to the Western power crisis has been slow and inadequate. The April order went further than before, but it did little to relieve utilities and consumers from the outrageous profits earned by the power suppliers. It created incentive for the suppliers to ensure that supply is tight enough for the least efficient plants to be called into service, ensuring high prices for everyone.

What FERC has wrought in the last year has brought misery to millions of households, business, and investors. For what purpose? To prove a point that uncontrolled markets will eventually bring about a balance of supply and demand, even if at enormous risk of chaos in the Western economy? FERC's experiment has come at a cost that far exceeds its benefits now or at any time in the foreseeable future.

For 65 years, FERC and its predecessor the Federal Power Administration oversaw conditions that created a stable power market that brought electricity to utilities and consumers at affordable prices and rewarded investors with reasonable rates of return. FERC's recent ideological devotion to free-market principles in a market that is anything but free and competitive has shattered the public's faith in the federal government's willingness and ability to ensure an adequate and affordable supply of power. FERC's actions threaten to bring a political end to appropriate deregulation initiatives around the country. This is a sad legacy, indeed, which I hope will be remedied as swiftly as possible by the Congress.

**SUPPLEMENTAL TESTIMONY OF ROY HEMMINGWAY
CHAIRMAN, OREGON PUBLIC UTILITY COMMISSION**

**Before the
SENATE GOVERNMENTAL AFFAIRS COMMITTEE**

JUNE 20, 2001

I appreciate the opportunity to offer this supplement to the hearing testimony I filed previously, in order to respond to the June 18 FERC order on Western power markets.

The June 18 order is a step in the right direction, but it is a small step and will not end the worst abuses that have characterized the Western power market this year.

First, the FERC order, by extending its April order to all hours and to all markets in the West, has taken appropriate action. There was no reason to limit the April order just to California and just to times of declared energy emergency.

However, the order remains flawed in fundamental ways. It allows all sellers, no matter what the cost of their generation to get the price of the highest cost resource running. While marginal cost pricing is appropriate for commodities in a competitive market where consumers have choices, electricity in the Western power market has not yet reached that status.

The result is a massive transfer of wealth from consumers and utilities to electricity suppliers, with little societal gain. Electricity is a commodity for which there are no immediate substitutes, and there are no technically feasible ways yet to send immediate retail price signals when wholesale prices are high. High wholesale prices on a hot July day in California do not mean that consumers will get an effective message to reduce consumption. First, the consumer gets very limited reward from reducing consumption, and second, there are no effective ways to send the price signal on an hourly, or even daily basis, as of yet. The net result of the high wholesale price for all sellers is no additional conservation and a transfer of wealth from utilities (and those consumers subjected to market rates) to the suppliers.

Second, the new order still provides incentive for "gaming" of the system by suppliers. All power sold into the market gets priced at the cost of the most expensive resource running at the time. As a result, there is incentive for suppliers to ensure that there are not enough efficient resources running and that the inefficient, price-setting resource must operate. With supplies tight and a small number of suppliers, a non-competitive market results where individual suppliers can anticipate the actions of other suppliers. FERC has not yet shown that high wholesale prices in a non-competitive market will deliver equal or more short-term supply than regulated prices. In fact, history suggests the opposite.

With very limited ways for consumers to perceive or respond to high prices, and with very few suppliers in a tight market able to manipulate prices, no one can say that the Western power market is competitive or operates like a real commodity market. FERC is still acting as if electricity in the West were like wheat or pork bellies, where buyers can find substitutes and respond to high prices, and no one supplier can affect the market or anticipate how other sellers into the market will respond. None of these conditions is true in the current Western power market.

The new order is another small step in FERC's slow retreat from its cruel no-holds-barred market philosophy. One can only wonder whether they will eventually retreat far enough and fast enough to save the West from economic catastrophe.

**Summary of Testimony of
Curt L. Hébert, Jr.
Chairman, Federal Energy Regulatory Commission
Before the Committee on Governmental Affairs
United States Senate
June 20, 2001**

The Commission's experience in regulating electric and natural gas utilities, and indeed the nation's experience in pricing and allocating vital goods and services, have taught us an important lesson: Consumers are better off if supply and pricing decisions are based on market mechanisms, rather than bureaucratic fiat. Thus, the Commission is committed to helping move this country toward open, competitive energy markets. At the same time, we recognize we must ensure that broken and dysfunctional wholesale markets are fixed. This poses challenges, particularly in California and the West.

In response to these challenges, the Commission has been working aggressively to reform market structures and to enhance consumer welfare in California and the West. The Commission has not lost sight of the point that the best way to lower wholesale electricity prices and to keep them low is to promote investment in badly needed supply-and-delivery infrastructure and to encourage demand reduction. The Commission's task remains to balance these goals to ensure that short-term measures do not undermine long-term priorities. The Commission's actions have focused on three objectives.

First, the Commission has taken important steps to mitigate prices in California. Some argue that we have not gone far enough, but the Commission has sought to ensure that price signals still elicit the additional supplies needed to remedy the current imbalance of supply and demand.

Second, the Commission has been working to address the need for infrastructure improvements throughout the West and especially in California. We have been trying to create the appropriate financial incentives to ensure that the transmission system is upgraded and that new natural gas pipelines are built.

Finally, we have been promoting the creation of a regional transmission organization (RTO) for the West. California depends on generation from outside the State. Conversely, the shortages and prices in California have affected the supply and prices in the rest of the West. A West-wide RTO will increase market efficiency and trading opportunities for buyers and sellers throughout the West.

The Commission's actions in California and the West are beginning to show results. On May 29, 2001, the Commission instituted a market monitoring and price mitigation plan in California, and prices immediately began to drop. The Commission still has more to do, but our past efforts have proven well-considered and appropriate.

**Testimony of
Curt L. Hébert, Jr.
Chairman, Federal Energy Regulatory Commission
Before the Committee on Governmental Affairs
United States Senate
June 20, 2001**

I. Overview

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to appear here today to discuss the Commission's role in the restructuring of electricity markets. The Commission has a vital role to play in this process, the focus of which is to ensure that wholesale electricity prices are, and remain, just and reasonable. This is a role that I and everyone else at the Commission take very seriously and have been working diligently to fulfill.

The Commission's experience in regulating electric and natural gas utilities, and indeed the nation's experience in pricing and allocating vital goods and services, have taught us an important lesson: Consumers are better off if supply and pricing decisions are based on market mechanisms, rather than bureaucratic fiat. Thus, the Commission is committed to helping move this country toward open, competitive energy markets.

At the same time, we recognize we must ensure that broken and dysfunctional wholesale markets are fixed. This poses challenges. Developing brand-new market-based rules to replace a decades-old system of government-sanctioned monopolies is not easy. We must be prepared to make adjustments as we learn more about how these new

markets function. Yet, we must also fight the impulse to make change for change's sake and, in the process, disrupt long-term goals.

The situation in California and the Western United States has forced us to confront even greater difficulties. In the electricity markets in California and the Western United States, there is a substantial imbalance of supply and demand. Any comprehensive evaluation of current prices charged in these markets must include consideration of the effect of prices on longer-term supply. As a federal appeals court recently said in rejecting challenges to the Commission's December 15, 2000 order on California, the Commission has been charting a "middle ground between the need for temporary price mitigation and the realization that competition must exist for the California energy market to survive in the long run." California Power Exchange Corp. v. FERC, No. 01-70031, 2001 U.S. App. LEXIS 6153 (9th Cir. April 11, 2001).

Also, by itself, the Commission can contribute only a small part of the solution to the energy problems in California and the West. While the Commission has authority to set rates for transmission and wholesale power in interstate commerce, and to regulate interstate natural gas pipelines and non-federal hydroelectric facilities in interstate commerce, it is state regulators that have siting authority for electric generation and transmission facilities, as well as authority over local distribution facilities (both for electricity and natural gas). State regulators also have the most significant authorities to encourage demand reduction measures.

In sum, the Commission is facing difficult choices. Reasonable people can differ over whether we have made the best choices; however, no one should doubt that the Commission has been working aggressively to ensure just and reasonable wholesale electricity prices in California as well as throughout the West and the rest of the country.

In today's testimony, I will describe the actions that the Commission has taken to address the problems in California and the West. In recent months, the Commission has taken dozens of actions to address dysfunctional wholesale energy markets in these regions. I will describe only the most significant Commission actions in this testimony; however, I have attached a comprehensive list. These actions focus on three objectives.

First, the Commission has taken important steps to mitigate prices in California. Some argue that we have not gone far enough, but the Commission has sought to ensure that price signals still elicit the additional supplies needed to remedy the current imbalance of supply and demand. The Commission has not lost sight of the point that the best way to lower wholesale electricity prices, and to keep them low, is to promote investment in badly needed supply-and-delivery infrastructure and to encourage demand reduction. The Commission's task remains to balance these goals to ensure that short-term measures do not undermine long-term priorities.

Second, the Commission has been working to address the need for infrastructure improvements throughout the West and especially in California. We have been trying to

create the appropriate financial incentives to ensure that the transmission system is upgraded and that new natural gas pipelines are built.

Finally, we have been promoting the creation of a regional transmission organization (RTO) for the West. California depends on generation from outside the State. Conversely, the shortages and prices in California have affected the supply and prices in the rest of the West. A West-wide RTO will increase market efficiency and trading opportunities for buyers and sellers throughout the West.

The Commission's actions in California and the West are beginning to show results. On May 29, 2001, the Commission instituted a market monitoring and price mitigation plan in California, and prices immediately began to drop. The following table (Table 1) shows Western electricity spot prices before and after mitigation:

TABLE 1

Western Electricity Prices (\$/MWh)					
Date	COB	Mid-Columbia	NP15	Palo Verde	SP15
Mid-Week Daily Spot Prices					
4-Apr	\$314	\$316	\$267	\$237	\$237
11-Apr	\$388	\$383	\$347	\$181	\$178
18-Apr	\$262	\$271	\$258	\$230	\$224
25-Apr	\$318	\$313	\$296	\$292	\$281
2-May	\$246	\$252	\$225	\$220	\$212
9-May	\$443	\$438	\$476	\$455	\$479
16-May	\$247	\$247	\$235	\$222	\$211
23-May	\$419	\$415	\$410	\$385	\$381
Daily Spot Prices Following Mitigation					
29-May	\$165	\$161	\$163	\$153	\$130
30-May	\$127	\$122	\$128	\$129	\$117
31-May	\$180	\$177	\$175	\$176	\$151
1-Jun	\$153	\$151	\$156	\$165	\$150
4-Jun	\$167	\$160	\$163	\$178	\$153
5-Jun	\$102	\$100	\$114	\$118	\$105
6-Jun	\$62	\$60	\$75	\$90	\$75

Price Chart Labels: "COB" is the California-Oregon Border price. **Mid-Columbia** is a market pricing point located in the Pacific Northwest. "NP15" is north of Path 15, and represents prices in northern California. "SP15" is south of Path 15, and represents prices in southern California. **Palo Verde** is located in Arizona near the California border, and represents prices in the Southwestern United States.

In addition, prices for Western forwards contracts are also down significantly. For example, year 2002 forwards transactions have dropped from \$127 per MWh to \$68 per MWh, and 2003 forwards have dropped from \$60 per MWh to \$41 per MWh, in the past month.

I recognize that the Commission still has more to do in addressing the energy problems in California and the West. We will continue to fulfill the duty we owe to consumers on these issues, but our past efforts have proven well-considered and appropriate.

II. Initial Investigation of California's Energy Problems

Electricity prices began rising dramatically in California last summer, and the Commission took prompt action. On July 26, 2000, the Commission ordered a staff investigation into the price fluctuations in electric bulk power markets in California and other regions. Order Directing Staff Investigation, 92 FERC ¶ 61,160 (2000). On November 1, 2000, upon reviewing the results of that investigation, the Commission proposed various remedies for California wholesale electric markets. San Diego Gas & Electric Company, et al., 93 FERC ¶ 61,121 (2000), reh'g pending.

Under the Federal Power Act, the Commission can order changes to existing rates, and all rules affecting those rates, only upon finding those rates or rules to be unjust and unreasonable. On December 15, 2000, after reviewing the comments on the November 1 proposal, the Commission issued an order in which it found that, under prior market rules and under certain conditions, prices in spot markets in California were not just and reasonable. San Diego Gas & Electric Company, et al., 93 FERC ¶ 61,294 (2000), reh'g pending. Consistent with the Federal Power Act, the Commission ordered changes to the market rules governing California's spot markets and also ordered additional market monitoring and price mitigation.

The Commission recognized that the primary flaw in the California market design was the requirement for the three investor-owned California utilities to buy and sell power exclusively through the spot markets of the California Power Exchange (PX). The

Commission concluded that the foremost remedy was to end this requirement and allow the utilities, first, to use their own remaining generation resources to meet demands and, second, to meet much of their remaining needs for power through forward contract purchases. This measure freed up 25,000 MW of generation that the utilities owned or controlled, which could be used directly to serve their load without having to sell it into the PX and buy it back at a much higher spot price. Our action returned to California the ability to regulate over one-half of its peak load requirements. The order also instituted an interim price mitigation measure and called for the development of a longer-term prospective mitigation plan.

III. Prospective Market Monitoring and Mitigation Plan

On April 26, 2001, the Commission adopted a prospective plan, which packaged together a number of related measures, for market monitoring and mitigation in California. San Diego Gas & Electric Co. v. Sellers of Energy and Ancillary Service, et al., 95 FERC ¶ 61,115 (2001). This plan, which was implemented on May 29, 2001, strikes a balance of bringing market-oriented price relief to the California electric market, providing greater price certainty to buyers and sellers of electric energy, promoting conservation, and - importantly - simultaneously encouraging investment in efficient generation and transmission.

The Commission established price mitigation for the real-time markets (*i.e.*, markets in which sales are arranged 24 hours or less before delivery of the power starts)

run by the California Independent System Operator Corporation (ISO). The price mitigation, based on a price determined from a market-oriented formula, applies when the ISO declares a reserve deficiency (i.e., when generating reserves are at or below 7.0 percent), based on the rationale that during other periods, suppliers have less incentive and ability to bid a high price. Under the price mitigation, a market-driven price for real-time electricity is determined each day based on market costs for electricity inputs (natural gas and emission allowances), and the fuel usage ratio ("heat rate") and emission rate for the least efficient generator needed to meet demand that day. All California generators bidding at or below this market-driven price are paid this price. Any California generator bidding above this price and selected to run is paid its price, subject to refund and justification, but its bid does not raise the market-driven price.

This price mitigation plan reflects the way pricing works in competitive markets. As in a competitive market, the price is set by the highest priced supply needed to meet demand. The plan provides incentives for investments in efficient generation. The market price under this plan is set by the price of the least efficient generating facility used each day. Any new facility will receive this same price. Thus, the more efficient the new facility is, the more it will earn. Conversely, the plan provides incentives for retiring or replacing inefficient, dirtier facilities.

The price mitigation plan fulfills the requirements of the Federal Power Act. The Commission has broad discretion in setting rates, and is not required to use cost-based

rates or any other specific methodology so long as the end result of its ratemaking is within a zone of reasonableness. The Commission's ratemaking can reflect non-cost factors such as the need to promote development of new supplies or transportation capacity.

Moreover, the price mitigation plan works. Price mitigation was triggered during portions of the day on Wednesday, May 30, and Thursday, May 31, 2001, when the ISO announced reserve deficiencies. As a result, prices for hourly imbalance energy, which had risen to around \$299 per MWh before the alert on Wednesday, fell to \$120 per MWh, and rose no higher than \$135 per MWh during the rest of the day. On Thursday, prices rose to \$130 per MWh prior to the alert, but fell to \$108 per MWh when mitigation began, and fell further to \$64 per MWh. Although no reserve deficiencies nor price mitigation have occurred in subsequent days, prices have remained relatively modest, not exceeding \$150 per MWh, and generally trending below \$100 per MWh for most hours.

The plan also limits the ability of generators to exercise market power by withholding capacity. The Commission will continue to monitor plant outages and coordinate with the ISO to ensure that generators are not withholding capacity from the market. In order to assure all available power to California, the plan also requires all generators in California (with the exception of hydroelectric power) to offer all their available power not yet scheduled to run in real time. Furthermore, the plan provides

that public utility sellers that engage in anti-competitive bidding behavior could be subject to refunds as well as revocation of their market-based rate authority.

The Commission intends to take action on rehearing requests for this order this week.

IV. Other Market Mitigation Actions

Pending development of the prospective mitigation plan, the Commission examined prices charged in California's spot markets during Stage 3 emergencies in January, February, March, and April of this year, and identified many transactions that warranted further investigation. The Commission required these sellers to either refund certain amounts (or offset these amounts against amounts owed to them) or provide additional information justifying their prices. Specifically, the Commission required refunds or offsets of approximately \$125 million dollars.

On March 28, 2001, the Commission ordered a hearing before an administrative law judge on whether El Paso Natural Gas Company or its marketing affiliate may have had market power and, if so, exercised it to drive up natural gas prices at the California border. Last week, the Commission broadened the scope of this investigation to include allegations of affiliate abuse by the two companies.

On April 30, 2001, the Commission approved a settlement with Williams Energy Marketing & Trading Company (Williams) and AES Southland, Inc., in which Williams agreed to pay refunds in the amount of \$8 million. The settlement was prompted by a

Commission order that the two utilities show why they should not be found to have increased power prices in the California market, and potentially compromised the reliability of the transmission network in violation of tariffs on file under the Federal Power Act, by extending outages at certain generating facilities.

On May 18, 2001, the Commission, recognizing that natural gas prices remain higher in California than in any other market in the United States, proposed new reporting requirements to provide the Commission with the necessary information on the prices of natural gas delivered to California. On May 22, 2001, the Commission issued a notice seeking comment on whether to re-impose ceiling prices for capacity release transactions on pipelines serving California.

V. Efforts to Increase Supply and Reduce Demand

On March 14, 2001, the Commission issued an order seeking to increase energy supplies and reduce energy demand in California and the West. Removing Obstacles to Increased Electric Generation and Natural Gas Supply in the Western United States, 94 FERC ¶ 61,272 (2001). The Commission implemented several measures immediately, including:

- o streamlining filing and notice requirements for various types of wholesale electric sales, including sales of on-site or backup generation and sales of demand reduction;
- o extending (through December 31, 2001) and broadening regulatory waivers for Qualifying Facilities under the Public Utility Regulatory Policies Act of 1978, enabling those facilities to generate more electricity;

- o expediting the certification of natural gas pipeline projects into California and the West; and,
- o urging all licensees to review their FERC-licensed hydroelectric projects in order to assess the potential for increased generating capacity.

On May 16, 2001, the Commission issued a follow-up order. Further Order on Removing Obstacles to Increased Electric Generation and Natural Gas Supply in the Western United States, 95 FERC ¶ 61,225 (2001). This order allows higher equity returns, and accelerated depreciation, for projects that increase electric infrastructure in the near future.

The Commission already is acting on many of the initiatives it announced in these orders. For example, in the month of April, the Commission significantly expedited its processing of applications - approved in a mere three or four weeks - to add significant amounts of natural gas pipeline capacity to California. Moreover, in recent months, the Commission has approved amendments to hydroelectric licenses that allow for additional generation at Western hydroelectric facilities in a manner that respects environmental values.

VI. Investigation of Other Real-Time Western Sales

The April 26 order adopting the prospective mitigation plan for California also opened a formal investigation into prices charged by public utilities for real-time wholesale power sales throughout the West. The Commission proposed: (1) to mitigate prices charged by all public utilities; and (2) to impose mitigation as a condition on all

non-public utilities using the interstate transmission facilities of public utilities. Similar to the Commission's approach for the ISO's market, the Commission proposed to apply price mitigation here only when contingency reserves fall below 7.0 percent in any control area in the Western Systems Coordinating Council. The Commission sought comments on what the price mitigation for these sales should be, stating that its intent is to mirror, to the extent possible, its approach in the ISO's real-time market. The Commission also proposed, as it required in the ISO's market, that generators should have to offer all energy available and not scheduled to run in real-time.

The Commission has received public comments on these proposals and intends to take further action this week.

VII. A West-Wide RTO

The development of a West-wide RTO is vital to preventing future problems in the West. Market conditions in California have affected markets throughout the West because the Western transmission system is an integrated grid. A West-wide RTO is critical to support a stable interstate electricity market that will provide buyers and sellers the needed non-discriminatory access to all transmission facilities in the West. A West-wide RTO will increase market efficiency and trading opportunities for buyers and sellers throughout the West.

On April 26, 2001, the Commission took major steps toward RTO formation in the West. Avista Corporation, et al., 95 FERC ¶ 61,114 (2001). First, the Commission

accepted key parts of a proposal for an RTO that will span eight Western states, RTO West. RTO West will operate (but not own) more than 90 percent of the high voltage transmission facilities from the U.S.-Canadian border to southern Nevada. The Commission said RTO West can serve as a platform for the ultimate formation of a West-wide RTO. In the same order, the Commission accepted a proposal for an independent transmission company within the RTO West structure, TransConnect. TransConnect will own and operate the transmission facilities of six utilities in the region.

In addition, at the Commission's discretion, the ISO and the three California investor-owned utilities made RTO filings on June 1, 2001. These filings await Commission action.

VII. Conclusion

As you can see, the Commission has been doing a great deal of work to help ease the present energy problems in California and the West, and to ensure that wholesale electricity rates in those regions are just and reasonable. There is still, however, work left to be done, and I can assure you that all of us at the Commission are committed to performing that work in a prompt and responsible fashion.

As we look to the future and consider the restructuring efforts in electricity markets in other regions, I would like to stress one thing: California's situation does not demonstrate the failure of electricity competition. Other states, such as Pennsylvania,

have been successful in implementing electricity competition, and their citizens have reaped the benefits of lower rates, higher reliability, and the wider variety of service options. I am confident that market-based solutions offer the most efficient way to move beyond the problems confronting California and the West and to ensure reasonable rates and reliable service throughout the country. Thank you.

APPENDIX

**Commission Staff Summary of
Recent Commission Actions on California Electricity Markets**

NOVEMBER 2000

- November 1: San Diego Gas & Elec. Co. (Complainant) v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 93 FERC ¶ 61,121 (order proposing remedies for California crisis on complaint of SDG&E)("November 1 Order")
- November 6: CPUC asks FERC to assist CPUC in investigation (Docket EL00-95-000)
- November 9: Public Conference re FERC-proposed remedies held in Washington (see 93 FERC ¶ 61,122)
- November 22: California Power Exchange Corp., 93 FERC ¶ 61,199 (order accepting amendments to streamline and clarify several provisions of the PX tariff)
- November 22: Pacific Gas & Elec. Co., 93 FERC ¶ 61,207 (order suspending PG&E transmission rate increase proposal)

DECEMBER 2000

- December 7:

SDG&E files request for emergency relief re natural gas prices (Docket RP01-180)

SoCal Edison files motion seeking to subpoena ISO Market Surveillance Committee data (Docket EL00-95-000)
- December 8:

San Diego Gas & Elec. Co., 93 FERC ¶ 61,238 (order waiving operating efficiency and other regulatory requirements governing "QFs" and other small power producers to boost power output in California)

San Diego Gas & Elec. Co., 93 FERC ¶ 61,238 (order waiving operating efficiency and other regulatory requirements governing "QFs" and other small power producers to boost power output in California)

December 8: California ISO Corp., 93 FERC ¶ 61,239 (order authorizing ISO tariff amendments to: (1) convert existing \$250/MWh hard cap on bids in the real-time market into a \$250/MWh breakpoint; (2) impose a penalty on generators who fail to comply with an ISO emergency order to provide power; and (3) assess costs against parties that underschedule demand or fail to deliver power.

- December 11 and 12: Motions for clarification, modification, and rehearing of December 8 ISO order
- December 13: SoCal Edison files motion for immediate modification of December 8 QF order
- December 13: California Power Exchange Corp., 93 FERC ¶ 61,260 (order accepting settlement re PX dispute resolution procedures)
- December 15: San Diego Gas & Elec. Co. (Complainant) v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 93 FERC ¶ 61,294 (Order adopting remedial measures to reduce reliance on volatile spot markets, including: (1) eliminating requirement that investor-owned utilities sell all their generation into the PX markets; (2) requiring 95 percent of demand to be scheduled in advance and establishing a benchmark for long-term contracts; and (3) imposing an interim \$150/MWh soft cap or "breakpoint" on spot markets pending development of longer term price mitigation plan)("December 15 Order")
- December 18 and 20: SoCal Edison and PG&E file emergency requests for rehearing of December 15 Order
- December 20: Marketers file emergency motion for order requiring ISO and PX not to disclose confidential information (Docket EC96-1663-000)
- December 22:

Dynegy files complaint alleging that rates paid for energy supplied in response to an ISO emergency order are confiscatory (Docket EL01-23-000)

Dynegy files emergency motion for clarifications of December 15 order to ensure payment to suppliers (Docket EL00-95-006)

Commission issues data request in response to December 7 SDG & E complaint re natural gas prices

- December 26: PX files request for rehearing and stay of December 15 order (Docket EL00-95-005)

- December 29:

Southern California Edison Co., 93 FERC ¶ 61,320 (order analyzing and accepting SoCal Edison rates for scheduling and dispatching)

Pacific Gas & Elec. Co., 93 FERC ¶ 61,322 (order rejecting PG&E filing regarding its scheduling on the ISO)

San Diego Gas & Elec. Co., 93 FERC ¶ 61,333 (order accepting SDG&E rate filing re so-called "RMR" generating units—units that must run to assure system reliability)

Southern California Edison Co., 93 FERC ¶ 61,334 (order accepting RMR tariff for SoCal Edison)

California ISO Corp., 93 FERC ¶ 61,337 (order accepting ISO grid management charges)

JANUARY 2001

- January 4: ISO files tariff amendment to relax its creditworthiness standards to allow PG&E and SoCal Edison to continue conducting transactions on ISO-controlled grid, notwithstanding downgrades in their credit ratings (Docket No. ER01-889-000)

- January 5: PX files tariff amendment to relax its creditworthiness standards to allow PG&E and SoCal Edison to continue trading in the PX markets, notwithstanding downgrades in their credit ratings (Docket No. ER01-902-000)
- January 8: San Diego Gas & Elec. Co., 94 FERC ¶ 61,005 (order clarifying that December 15 Order was not intended to bar the PX from engaging in bilateral forward contracting)
- January 12:
 - Pacific Gas & Elec Co., 94 FERC ¶ 61,025 (order authorizing intra-corporate reorganization of PG&E Corporation)
 - Sierra Pacific Power Co., 94 FERC ¶ 61,033 (order denying rehearing re priority use of certain California grid interties)
- January 16: California Power Exchange Corp., 94 FERC ¶ 61,042 (order authorizing PX to implement emergency tariff changes to allow SoCal Edison two additional days to make its payment)
- January 18: ISO files tariff amendment to conform to December 15 order re payment procedures for RMR operations (Docket ER01-991-000)
- January 19 through February 12: Various persons, including State of California and CPUC, file requests for late intervention and rehearing of January 12 order authorizing intra-corporate reorganization of PG&E Corporation (Docket Nos. EC01-41-000 and EC01-49-000)
- January 23: PG&E files motion for immediate order to stop PX from liquidating PG&E's long-term or "block forward" contracts after PG&E refuses PX demand for payment to cover a portion of SoCal Edison's nonpayment for transactions in the PX spot markets (Docket No. EL01-29-000)
- January 23: FERC staff conducts technical conference with industry representatives re prospective spot market monitoring and mitigation plan
- January 25: Pacific Gas & Elec. Co., 94 FERC ¶ 61,082 (order denying rehearing request re PG&E transmission rates)

- January 29: San Diego Gas & Elec. Co., 94 FERC ¶ 61,085 (order finding PX in violation of December 15 order for failing to implement \$150/MWh breakpoint)

FEBRUARY 2001

- February 1: Los Angeles Dept Water & Power files emergency petition for reimposition of price cap on natural gas pipeline capacity (Docket RP01-222-000)
- February 2:
 - SoCal Edison files emergency motion for cease and desist order preventing PX from liquidating SoCal Edison's long-term "block forward" contracts to cover SoCal Edison's nonpayment for transactions in the PX spot markets (Docket EL01-33-000)
 - SoCal Edison and PG&E file for immediate suspension of underscheduling penalties imposed by December 15 order (Docket EL01-34-000)
- February 6: Mirant Delta files complaint with request for fast track processing that: (1) seeks enforcement of the creditworthiness standards for PG&E and SoCal Edison in the ISO tariff; and (2) alleges ISO violation of December 15 order for failure to replace governing board (Docket EL01-35-000)
- February 7: Pacific Gas & Elec. Co., 94 FERC ¶ 61,093 (order accepting settlement re PG&E transmission rates)
- February 8 and 12, and March 2: Various parties, including Coral Power, Enron, SDG&E, Salt River Project Agricultural Improvement and Power District, Sacramento Municipal Utility District, and Public Service Company of New Mexico file three complaints requesting that the PX be barred from further implementing tariff "charge back" provision that allows the PX to recover uncollected amounts owed by PG&E and SoCal Edison from other market participants (Docket EL01-36-000, EL01-37-000, and EL01-43-000)

- February 14: California ISO Corp., 94 FERC ¶ 61,132 (order rejecting ISO and PX tariff amendments relaxing creditworthiness standards for PG&E and SoCal Edison as applied to transactions affecting third-party suppliers)
- February 15: FERC staff meets with PX regarding requirements for implementing \$150/MWh breakpoint
- February 21:
 - California ISO Corp., 94 FERC ¶ 61,141 (order accepting amended Transmission Control Agreement among ISO and transmission owners and addressing complaints by City of Vernon regarding conditions of becoming participating transmission owner)
 - California ISO Corp., 94 FERC ¶ 61,148 (order denying rehearing of October 2000 order relating to ISO's Transmission Access Charge)
 - Pacific Gas & Elec. Co., 94 FERC ¶ 61,154 (order denying intervention and rehearing of January 12 order authorizing PG&E Corporation intra-corporate reorganization)
- February 22: generators request order compelling ISO to comply with February 14 order re creditworthiness (ER01-889-002)
- February 23: San Diego Gas & Elec. Co., 94 FERC ¶ 61,200 (order on rehearing of December 29 order re reassignment of RMR costs)
- February 26: PX files request for clarification/rehearing of February 14 creditworthiness order
- February 28:
 - PX makes compliance filing proposing implementation of \$150 MWh breakpoint requirement; seeks rehearing of January 29 order (EL00-95-016; EL00-98-015);
 - Tucson Electric files complaint against the Governor of California challenging California's "commandeering" of PG&E and SoCal Edison's long-term contracts from the PX (EL00-95; EL01-40-000)

Complaint filed by Strategic Energy L.L.C. versus ISO concerning out-of-market costs (EL01-41-000)

MARCH 2001

- March 1:

ISO files revised tariff amendment on creditworthiness in compliance with February 14 order rejecting earlier proposed amendment

California Electricity Oversight Board files motion for clarification of December 15 order

ISO and Electricity Oversight Board file motion for issuance of refund notice to sellers, request for data, and request for hearing
- March 2: Universal Studios files complaint against SoCal Edison challenging penalties Universal was charged for failing to interrupt its service under its interruptible service contract with SoCal Edison (Docket No. EL01-42-000)
- March 7 through 23: Various persons file second round of requests for intervention and rehearing of January 12 order authorizing PG&E Corporation intra-corporate reorganization
- March 8: Ridgewood Power requests emergency relief and extension of waiver of "QF" regulations applicable to small generators (Docket No. EL00-95-020)
- March 9:

San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 94 FERC ¶ 61,245 (Order directing refunds or further justification for charges)

"Staff Recommendation on Prospective Market Monitoring and Mitigation for the California Wholesale Electric Power Market" (Docket Nos. EL 00-95-012, *et al.*)

San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 94 FERC ¶ 61,243 (Order dismissing rehearing request of 1/8/01 order)

- March 14:

"Order Removing Obstacles to Increased Electric Generation and Natural Gas Supply in the Western United States and Requesting Comments on Further Actions to Increase Energy Supply and Decrease Energy Consumption (Docket No. EL 01-47-000) (order includes: (1) requirement that ISO and western transmission owners file list of grid enhancements that can be implemented in short term; (2) extension of waiver of QF regulations through December 31, 2001; (3) authorization for western businesses with back-up generators and customers who reduce their consumption to sell wholesale power at market-based rates; and (4) solicitation of comment on additional proposals)

Cities of Anaheim, et al. v. ISO, 94 FERC ¶ 61,268 (order dismissing in part and granting in part complaint alleging that certain cities are being charged inappropriate costs when ISO allocates the cost of power obtained through emergency orders to generators).

AES Southland, Inc., Williams Energy Trading & Marketing Co., 94 FERC ¶ 61, 248 (order directing parties to explain why they should not be found in violation of the Federal Power Act for engaging in actions that inflated electric power prices)

- March 15: Chairman testifies before the Senate Committee on Energy and Natural Resources
- March 16: San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 94 FERC ¶ 62,245 (notice re proxy market clearing price and refunds for February transactions)
- March 20: The Commissioners testify before the House Committee on Energy and Commerce, Subcommittee on Energy and Air Quality

- March 21: Reliant files fast-track complaint against the ISO challenging the ISO's issuance of emergency orders requiring generators to supply power (Docket No. EL01-57-000)
- March 22 through April 9: Parties file requests for rehearing of 3/9 order directing refunds (Docket No. EL00-95-019, et al.)
- March 28: CPUC v. El Paso Natural Gas Co., et al., 94 FERC ¶ 61,338 (order dismissing portion of complaint alleging affiliate abuse but ordering public hearing on whether El Paso exercised market power to drive up natural gas prices)
- March 29: ISO files motion for order directing Reliant to keep generating unit in service (Docket No. EL01-57-000)

APRIL 2001

- April 2 through 4: Proposed generation interconnection procedures filed by California ISO, PG&E, SDG&E, and SoCal Edison in compliance with 12/15 order (Docket Nos. EL00-95-022, -023, -024, -025)
- April 5: Complaint by California Cogeneration Council, et al., alleging that a CPUC decision affecting QF rates violates PURPA (Docket No. EL01-64-000)
- April 6:
 - San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 95 FERC ¶ 61,021 (Order dismissing rehearing, accepting compliance filing, and directing the recalculation of lower wholesale rates)
 - Pacific Gas and Electric Co., et al., 95 FERC ¶ 61,020 (Order on complaints concerning use of chargebacks and liquidation of collateral)
 - Kern River Gas Transmission Co., 95 FERC ¶ 61,022 (Order issuing certificate for facilities to transport natural gas from Wyoming to California)

California Independent System Operator Corporation, 95 FERC ¶ 61,024
(Order granting motion of generators to compel ISO to comply with creditworthiness requirements)

California Independent System Operator Corporation, 95 FERC ¶ 61,026
(Order granting clarification in part and denying rehearing of order on PX tariff creditworthiness amendment)

Southern California Edison Co and Pacific Gas and Electric Co, 95 FERC ¶ 61,025 (Order deferring action on request for suspension of underscheduling penalty and issuing request for information)

- April 9: Ridgewood Power files an updated request for emergency relief re QF regulations in light of PG&E's bankruptcy filing
- April 10: Commission convenes Western Energy Issues Conference in Boise, Idaho
- April 10-12: The Chairman and General Counsel testify before the House Committee on Government Reform regarding wholesale electricity prices in California and the West
- April 16:

San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX (unpublished notice of proxy price for March wholesale transactions in Docket No. EL00-95-028, et al.)

Californians for Renewable Energy files complaint against BC Hydro and other generators alleging withholding (Docket No. EL01-65-000)
- April 18: Public Utilities Commission of the State of California v. El Paso Natural Gas Co., et al., 95 FERC ¶ 61,089 (Order on rehearing regarding allegations of affiliate abuse and market power by gas pipeline)
- April 25: Tractabel Power Inc files a petition for enforcement action alleging that a CPUC decision affecting QF rates violates PURPA (Docket No. EL01-67-000)
- April 26:

San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 95 FERC ¶ 61,115 (Order establishing prospective mitigation and monitoring plan for the California wholesale electric markets and establishing an investigation of public utility rates in wholesale Western energy markets)

Avista Corporation, et al., 95 FERC ¶ 61,114 (Order granting, with modification, RTO west petition for declaratory order and granting Transconnect petition for declaratory order)

CalISO files bylaw amendments incorporating changes in governance (Docket No. EL00-95-030, et al.)

- April 27:

Calpine Corp. files a petition for enforcement action and/or a declaratory order alleging that a CPUC decision affecting QF rates violates PURPA (Docket No. EL01-71-000)

Commission notices initiation of investigation of rates in the WSCC (Docket No. EL01-68-000)

- April 30:

Edison Mission Energy files an application for approval of corporate reorganization (Docket No. EC01-93-000)

AES Southland, Inc. and Williams Energy Marketing & Trading Co., 95 FERC ¶ 61,167 (Order approving stipulation and consent agreement with respect to issues raised in the 3/14 show cause order)

MAY

- May 1:

The Commissioners testify before the House Subcommittee on Energy and Air Quality to discuss the proposed Electricity Emergency Relief Act

The Director of Markets, Tariffs and Rates issues a letter to the ISO, PG&E, SDG&E, and SoCal Edison offering staff's assistance to complete RTO filings

- May 2: The Commission instituted a proceeding under FPA § 210(d) in Docket No. EL01-72-000 to consider whether it may need to order interconnection or transmission services to alleviate generation capacity shortages in California
- May 3: Western Systems Coordinating Council and two regional transmission groups file a petition for a declaratory order disclaiming jurisdiction or for an order approving the transfer of functions to a new Western Electricity Coordinating Council.(Docket Nos. EL01-74-000/EL99-23, et al.)
- May 7:

Requests for rehearing of the Commission's 4/26/01 market mitigation order filed (Docket No. EL00-95-031, et al.)

Request for rehearing of the 4/6/01 order granting motion filed (Docket No. ER01-889-004, et al.)

El Paso Natural Gas Co., 95 FERC ¶ 61,176 (Order issuing a certificate permitting increased pipeline capacity to California by converting an oil pipeline to gas service)

City of Vernon files a complaint asking FERC to prevent the ISO from subjecting Vernon's customers to rolling blackouts (Docket No. EL01-75-000)
- May 9: Director of OMTR issues a letter to Southern California Air Quality Management District requesting information on its NOx Emission Program
- May 10: Cogeneration Ass'n of California files a petition for enforcement action and/or a declaratory order alleging that a CPUC decision affecting QF rates violates PURPA (Docket No. EL01-77-000)

- May 11: CalISO files a compliance filing in Docket No. ER01-889-005, as directed in the 4/6/01 order granting motion
- May 14:
 - Cities of Anaheim, et al. v. CalISO, 95 FERC ¶ 61,197 (Order on rehearing concerning complaint about OOM costs)
 - Edison Mission Energy, 95 FERC ¶ 61,198 (Order approving corporate reorganization)
 - San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 95 FERC ¶ 62,125 (notice of proxy price for April wholesale transactions in Docket No. EL00-95-033, et al.)
- May 16:
 - Removing Obstacles To Increased Electric Generation And Natural Gas Supply In The Western United States, 95 FERC ¶ 61,225 (Further order on removing obstacles to increased energy supply and reduced demand in the Western United States and dismissing petition for rehearing)
 - San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Services into Markets Operated by CalISO and CalPX, 95 FERC ¶ 61,226 (Order granting motions for emergency relief by QFs in part and establishing further procedures)
 - California Independent System Operator Corporation, 95 FERC ¶ 61,199 (Order accepting in part and rejecting in part ISO Tariff Amendment No. 38)
- May 18: Reporting of Natural Gas Sales to the California Market, 95 FERC ¶ 61,262 (Order proposing reporting requirements on natural gas sales to California markets and requesting comments)
- May 22: San Diego Gas & Electric Co., et al., 95 FERC ¶ 61,264 (Order requesting comments on whether the Commission should reimpose the maximum rate ceiling on short-term capacity release transactions into California)

- May 24: Commission convenes a technical conference regarding pipeline capacity into and adequacy within California (Docket No. PL01-4-000)
- May 25:
 - San Diego Gas & Electric Co., et al., 95 FERC ¶ 61,275 (Order providing clarification and preliminary guidance on implementation of mitigation and monitoring plan)
 - CE Generation files a petition for enforcement action alleging that a CPUC decision affecting QF rates violates PURPA (Docket No. EL01-83-000)

JUNE

- June 1:
 - California ISO, SDG&E, SoCal Edison, and PG&E submit RTO compliance filings in RT01-85, et al.
 - Salt River Project Agricultural Improvement and Power District files a complaint alleging the ISO overcharged Neutrality Adjustment Charges during CY 2000 (Docket No. EL01-84-000)
- June 4: Cogeneration Council of California, et al. (Notice of intent not to act re two petitions for enforcement filed pursuant to PURPA § 210(h) in Docket Nos. EL01-64-000 and EL01-67-000)
- June 11: CPUC v. El Paso Natural Gas Co., et al., 95 FERC ¶ 61,368 (Order granting in part rehearing of 3/28/01 order and setting for hearing the allegations of affiliate abuse raised by complainants)
- June 13:
 - California Independent System Operator Corporation, 95 FERC ¶ 61,391 (Order denying rehearing of order granting motion of generators to compel ISO to comply with creditworthiness requirements)

California Independent System Operator Corporation, 95 FERC ¶ 61,390
(Order accepting ISO tariff amendments to conform with FERC formatting requirements)

COURT CASES

- In re: Southern California Edison Co., No. 00-1543 (D.C. Circuit Jan. 5, 2001) (petition for writ of mandamus to order FERC to set cost-based rates denied)
- City of San Diego v. FERC, No. 00-71701 (9th Cir.)(petition for writ of mandamus regarding Dec. 15 order; petition denied on April 11, 2001)
- In re: California Power Exchange Corp., No. 01-70031 (9th Cir.)(petition for writ of mandamus to stay Dec. 15 order; petition denied on April 11)
- California Municipal Utilities Association v. FERC, No. 01-1156 (D.C. Cir.)(petition for review of Dec. 15 order)
- Modesto Irrigation District v. FERC, No. 01-1157 (D.C. Cir.)(petition for review of Dec. 15 order)
- County of San Diego v. FERC, No 01-1178 (D.C. Cir.)(petition for review of Dec. 15 order)
- Reliant Energy Power Generation, Inc., et al. v. FERC, No. 01-1179 (D.C. Cir.)(petition for review of Dec. 15 order)
- City of San Diego v. FERC, No. 01-70609 (9th Cir.)(petition for review of Dec. 15 order)
- Western Power Trading Forum and Coalition of New Market Participants v. FERC, No. 99-1532 (D.C. Cir.)(petition for review challenging the Commission's approval of governance for the California ISO dismissed on 4/10/01)
- In re: John L. Burton, et al. v. FERC, No. 01-70812 (9th Cir.) (Court denied petition for writ of mandamus on 5/29/01)

STAFF INVESTIGATIONS

The Commission's staff has completed or initiated a number of public investigations, audits, and studies of matters relating to events in California, including:

- An audit of generation outages (report issued February 2, 2001)
- An analysis of the effect of a western region-wide price cap (released in early February)
- An analysis of causes of high prices in Pacific Northwest and California (released in early February)

Testimony of
Commissioner Linda K. Breathitt
Federal Energy Regulatory Commission
Before the
Committee on Governmental Affairs
United States Senate
June 20, 2001

Mr. Chairman and Members of the Committee:

I appreciate this opportunity to appear before you today to discuss the role of the Federal Energy Regulatory Commission regarding the restructuring of California's electricity market and its implications for other states and regions. Since the issuance of Order Nos. 888 and 889 on April 24, 1996, the Commission has focused its attention on opening the bulk power market to competition. This effort was prompted, in part, by Congress's enactment of the Energy Policy Act of 1992. The Commission's main objective has been to employ market-oriented solutions to the problems facing the wholesale electricity sector in order to achieve the best long-term results for the public. While the situation in California and the West has certainly challenged this resolve, I remain steadfast in my commitment to ensure that consumers benefit from well-functioning electricity markets.

The magnitude of the California energy crisis, and its potential disruptive effect, cannot be overestimated. The extraordinarily high prices for electricity and the extreme shortages of supply have created a consumer backlash against the restructured electricity markets in California. Nationwide, the move toward competitive markets is undoubtedly affected by this crisis and could even be suspended if other states, fearful of what they are seeing in the West, terminate their restructuring efforts. I believe it is important for all Americans to understand what is happening. That is why I welcome the interest and involvement of the Committee in this matter and I look forward to working with you to address these problems.

It goes without saying that the flawed electricity markets that exist in California today are not at all what proponents of electric restructuring had in mind when this process was initiated both at the federal and state levels six to eight years ago. Nevertheless, consumers and elected officials are unlikely to have continued tolerance for inefficient and problematic markets if they are allowed to persist. For this reason, I believe it is imperative for regulators to take firm steps to improve the markets so that the present turmoil will not cause us to abandon or retreat from the objective of opening the transmission system to fair and non-discriminatory access and making the wholesale electricity markets more competitive. How we proceed over the next year or so will, in large part, determine whether our goals will be met.

It is important to understand that the causes of the California energy crisis are highly complex. I believe there is a danger of oversimplifying the problems by attributing them to the bare fact that California restructured its retail electricity markets. Restructuring programs have taken on many forms and have been implemented under many different circumstances. In retrospect, it is clear that California's restructuring plan embodied features that other states can and should avoid. In addition, a confluence of factors outside of the state's regulatory regime have created problems that are unique to California's situation. For this reason, it is highly unlikely that other regions of the country will experience this identical set of circumstances. However, some of the problems we see in the West could materialize in other regions. The Commission has focused much of its attention over the past year in defining and understanding the causes of the market disruptions and high electricity prices in California and

throughout the West and implementing appropriate remedies, which are beginning to work.

A Commission staff report completed on November 1, 2000 found that: (1) market forces in the form of significantly increased power production costs combined with increased demand due to unusually high temperatures to create unstable conditions in the West; (2) scarcity of available generation resources throughout the Western region played a significant role; (3) existing market rules worsened the tight supply-demand conditions by exposing the three investor-owned utilities in California to the volatility of the spot energy market without affording them the opportunity to mitigate volatility by hedging their positions in forward electricity markets; (4) an underscheduling of demand and supply in the California Power Exchange's (PX) day-ahead and hour-ahead markets increased the activity in the more volatile real-time spot market operated by the California Independent System Operator (ISO); and (5) unplanned outages of power plants increased significantly during the summer of 2000.

It has also become apparent that the causes of the California energy crisis are not only state-specific, but regional in nature. For that reason, we are now engaged in a broad examination of all bulk power markets throughout the Western United States. Furthermore, as I discuss in more detail below, I continue to believe that an important factor in resolving the problems in the electric power market in California and the West is the need to address the impediments in the natural gas market.

I believe the Commission has taken bold and decisive actions, within its jurisdiction, to remedy the extreme distortions in the California markets and to address instances of potential market power abuses. Since last August, the Commission has issued over 50 orders implementing important remedial

measures and price mitigation mechanisms, instituting investigations into rates and market design flaws, establishing programs to maximize electricity supply, delivery and demand reduction, and directing sellers to provide refunds of excess amounts charged for certain electric energy sales. Several of the major orders issued by the Commission over the past year deserve to be highlighted.

On August 23, 2000, citing serious concerns about the impact of significant increases in electric rates on residents and businesses in the San Diego area, the Commission instituted an investigation pursuant to Section 206 of the Federal Power Act into the justness and reasonableness of the rates and charges of public utilities that sell energy and ancillary services to or through the ISO and PX. The investigation also sought to uncover whether the institutional structures and bylaws of the ISO and PX were adversely affecting the efficient operation of competitive wholesale electric markets in California.

On November 1, 2000, the Commission issued an order proposing measures to remedy the problems that were identified in the California electricity markets. Our order found that electric market structure and market rules for wholesale sales of electric energy in California were seriously flawed and that these structures and rules, in conjunction with an imbalance of supply and demand in California, have caused, and continue to have the potential to cause, unjust and unreasonable rates for short-term energy under certain conditions. The order proposed specific remedies that were intended to correct the market flaws, including an over-reliance on spot markets in California. The Commission proposed, among other things, to (1) eliminate the requirement that the investor-owned utilities must buy and sell power through

the PX; (2) require load serving entities to schedule 95 percent of their transactions in the Day-Ahead markets or be subjected to a penalty charge; and (3) to replace the existing PX and ISO stakeholder boards with independent non-stakeholder boards. To ensure fair prices while market reforms were being put in place, the order proposed specific measures to mitigate high prices. The proposed mitigation plan included a modification of the single price auction so that bids above \$150/MWh could not set the market clearing price that is paid to all bidders and imposing certain reporting and monitoring requirements for transactions and bids above the \$150/MWh breakpoint, as well as retaining a refund obligation for sales into the ISO and PX markets for the period October 2000 through December 2002. The November 1, 2000 order initiated an expedited hearing process that included dates for the submission of comments and supporting evidence by parties and for a public conference, with the intent of issuing a final order before the end of the year 2000.

On December 15, 2000, the Commission issued its final order implementing a market mitigation and monitoring plan for California as a result of the expedited hearing process initiated in November 1, 2000. For the most part, the elements of the final plan mirror those proposed on November 1, and include: (1) the elimination of the mandatory PX buy-sell requirement; (2) a benchmark price for wholesale bilateral contracts; (3) penalties for underscheduling load in forward markets; (4) a price mitigation plan that included the \$150/MWh breakpoint mechanism as an interim measure; (5) an independent governing board for the ISO; and (6) a requirement that the ISO and investor-owned utilities file generation interconnection procedures. Our December 15, 2000 order stated that the interim \$150/MWh breakpoint mechanism would be replaced on or before May 1, 2001 by a

real-time, forward-looking price mitigation plan.

On March 9, 2001, the Commission issued an order establishing, among other things, a just and reasonable rate screen above which sellers will be required to provide refunds of excess amounts charged for certain electricity energy. The Commission developed this screen by, in effect, establishing the market clearing price that would have occurred had the sellers bid their variable costs into a single price auction, which is what would have occurred had there been competitive forces at work. Using this methodology, the Commission has determined that, during the period January through April 2001, potential refunds by sellers totaled over \$124 million.

On March 14, 2001, the Commission issued an order announcing certain actions it was taking within its regulatory authority to help increase electric generation supply and delivery in the Western United States, to facilitate demand responsiveness, and to protect consumers from supply disruptions. The Commission implemented some measures immediately and sought comment on other proposed measures that might help maximize supply, delivery, and demand reduction. Among the actions the Commission took immediately were to request a list of grid enhancements that could be undertaken in the short term, extend certain waivers for Qualifying Facilities, waive certain notice and filing requirements for wholesale power sales from on-site generation at businesses, authorize the resale of load reductions at market-based rates, and request hydroelectric licensees to examine their projects for efficiency improvements. Among the proposals on which the Commission sought comment were allowing premiums on equity returns and accelerated depreciation for certain transmission investments, allowing revenue recovery for non-capital intensive

expenditures that increase transmission capacity, allowing the roll-in of certain interconnection costs for new supply, using the interconnection authority of Section 210(d) of the Federal Power Act, waiving blanket certificate regulations to increase the dollar limits for automatic and prior-notice authorizations for natural gas facilities, offering blanket certificates for portable compressor stations, and allowing greater operating flexibility at hydroelectric projects.

Pursuant to the March 14 order, the Commission convened staff conferences in Portland, Oregon and Sacramento, California, to discuss methods for allowing increased generation at hydroelectric projects while ensuring environmental protection. On April 10, 2001, the Commission held a conference on Western Energy Issues in Boise, Idaho to discuss price volatility and other Commission-related issues with state commissioners and others from Western states. All FERC Commissioners attended, as did representatives from Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

As a follow-up to our March 14, 2001 order, on May 16, 2001, the Commission issued a further order on supply and demand issues. The Commission reaffirmed actions implemented by the March 14 order, and implemented many of the additional actions identified in that order, including allowing premiums on equity returns and accelerated depreciation for projects that increase electric energy transmission capacity in the short term, with a baseline cost of equity of 11.5 percent.

On April 26, 2001, the Commission issued a major order establishing remedies and market mitigation programs for the California and Western markets that were targeted to specific causes of the California energy crisis. These remedies replace the interim mitigation plan implemented by the

December 15, 2000 order. The fundamental principles of this plan are to:

- (1) enhance the ISO's ability to coordinate and control planned outages in the real-time market during all hours;
- (2) require sellers with Purchased Generator Agreements, as well as non-public utility generators located in California that make sales through the ISO's markets or that use the ISO's interstate transmission grid, to offer all their available power in real time during all hours;
- (3) require public utility load serving entities to submit demand-bids identifying the price at which load will be curtailed in the real-time market during all hours;
- (4) establish conditions, including refund liability, on public utility sellers' market-based rate authority to prevent anti competitive bidding behavior in the real-time market during all hours;
- (5) require the ISO to submit weekly reports on schedule, outage, and bid data for all hours so that the Commission can continue to monitor generating unit outages and real-time prices; and
- (6) establish a mechanism for price mitigation for sellers bidding into the ISO's real-time market during a reserve deficiency that includes a proxy formula for determining the real-time market clearing price when mitigation applies.

It is important to note that our April 26 order also initiated a Federal Power Act Section 206 investigation into the rates, terms and conditions of public utility sales for resale of electric energy in interstate commerce in the Western Systems Coordinating Council (WSCC). This investigation is currently underway.

We have seen significant reductions in electric power costs since our April 26 order was implemented on May 29. The daily prices for spot market sales to California on May 23 ranged from \$381/MWh to \$419/MWh. The daily spot prices after the mitigation plan took effect have trended much lower. On

June 6, for instance, the spot prices ranged from \$62/MWh to \$90/MWh.

As we continue to monitor the situation in the West, the Commission will examine its role in these matters and take appropriate action when necessary. One important aspect of the electricity system in the West and elsewhere in the country, in which I believe the Commission's jurisdictional authority should be increased, pertains to the siting of new transmission facilities. While I wholeheartedly encourage conservation and embrace demand reduction mechanisms, Americans need to understand that due to obsolescence, shifts in regional usage patterns, and continued growth in consumer demand, the country's energy infrastructure must be expanded.

Currently, under the Federal Power Act, the Commission has no role in the permitting and siting of these new facilities. I believe FERC needs to have siting authority for interstate transmission facilities because shortages of transmission are no longer just single state issues. I believe these shortages have become interstate commerce issues that must be addressed by the Federal Government. I do believe, however, that siting authority for new generating and distribution facilities should remain at the state level.

While energy prices have dropped recently, we must understand that the problems are caused not only by market design flaws, but also by the lack of adequate supply and delivery capability. In addition, we need a diverse generation mix that includes renewable energy resources. We must continue to develop the infrastructure necessary to meet the growing demands our society places on the electric grid. This will require difficult decisions on siting. If such decisions are avoided or delayed, I am afraid the problems we have seen in California and the West will be magnified and experienced throughout the country.

With regard to transmission upgrades and expansion, I believe the Commission's Order No. 2000, issued in December 1999, will create an important regulatory framework. Order No. 2000 is intended to encourage the formation of Regional Transmission Organizations throughout the United States. The order includes a specific functional requirement for RTOs to develop a strategy for transmission planning and expansion. The order also describes innovative pricing options that the Commission would consider for RTOs. Such ratemaking mechanisms could provide necessary incentives for the construction of new or enhanced transmission facilities. I believe the formation of RTOs in the West will be a significant benefit for many aspects of the electric markets in that region, including the enhancement of the transmission grid.

The Commission also has implemented some specific demand response programs that are within our jurisdiction. As we have noted in recent orders, dropping even a few megawatts off the electric system at peak periods is more efficient and economical than the incremental cost of generating them. The Commission has recognized that these so-called "negawatts" or demand reductions offer a short-term and cost-effective means to provide additional resources during times of scarcity. We have recently instituted programs allowing electric consumers--both retail and wholesale--to reduce their own consumption of electricity for the purposes of reselling their load reduction at wholesale using market-based rates. Demand response programs recognize that customers should be able to respond to price signals and that customers with more elastic demands can relinquish load to customers who place a greater value on obtaining power at that particular time.

Due to the continuing convergence of the electric and natural gas industries, problems that have affected the electric utilities in California and the West also have been felt in the natural gas industry. And while much has been said about the difficulties facing the electric markets in California and the West, I believe that much more attention should be focused on the natural gas issues facing this region. I have a deep concern about the impact of prolonged periods of high natural gas prices on industries and communities in the West, particularly on electric generation costs. The price of natural gas is the variable that has the greatest ability to influence the cost of gas-fired electric generation. This is true even for more efficient electric generation plants. For example, when gas costs were \$2 per Mcf, the cost of generation at a plant with a 10,000 Btu/kWh heat rate was \$20 per megawatt-hour. When natural gas prices surged to \$50 per Mcf, the cost of generation soared to \$500 per megawatt-hour. My point is that the sustained high prices of natural gas contribute to high electricity prices in California and the West.

As with the electric markets, the problems facing the natural gas markets in California are multi-faceted, complex and interrelated. I have serious concerns about: (1) the need for more interstate natural gas pipeline capacity to California; (2) the need for more intrastate natural gas pipeline capacity from the California border to the markets (more "take-away" capacity); (3) policies that create an incentive for the utilities in California to rely too heavily on spot market purchases of natural gas; (4) excessively low working gas storage inventories; (5) the lack of firm capacity rights on intrastate natural gas systems in California; (6) the appropriateness of continuing the waiver of the price-cap on short-term secondary market transactions; and, most importantly, (7) allegations

of the exercise of market power by interstate pipelines, affiliate preference, and the withholding of interstate pipeline capacity. While I recognize that some of these matters are not within the Commission's jurisdiction, I believe they are all relevant to the objective of stable natural gas prices in California.

I would like to point out, with respect to pipeline infrastructure needs, that simply expediting the certification and construction of additional interstate pipeline capacity to California will not be an adequate solution. Without adequate intrastate take-away capacity at the California border, recent actions by the Commission to approve additional interstate pipeline capacity on an expedited basis may not have the desired effect of increasing natural gas supplies in the California markets where they are needed. Indeed, uncoordinated interstate pipeline expansions could serve to exacerbate congestion that exists at the California border. At my urging, the Commission held a technical conference on May 24, 2001, to analyze California natural gas infrastructure needs. This conference identified both physical constraints and regulatory impediments to natural gas transportation into and within California. Comments on the issues raised at the conference are due June 25, 2001.

With regard to the reliance on the spot market for purchases of natural gas, it is my understanding that the California Public Utilities Commission (CPUC) allows for recovery of gas costs that meet a benchmark determined monthly by the use of average spot market prices. It is my opinion that such a policy creates an incentive to rely too much on spot market purchases of natural gas, thereby exposing consumers to more volatile gas prices. I believe that local distribution customers (LDCs) and other

gas purchasers in California and other states should have the ability to use appropriate risk management tools. The Commission's December 15, 2000 order on remedies for California found that a major cause of the high electric prices in California was the over-reliance on the spot market for electricity. I believe the same logic applies to the natural gas market.

The low working-gas storage inventories and the lack of firm capacity rights for non-core customers (such as electric generators) on intrastate pipeline systems are issues that I urge the CPUC to address, as they appear to be serious impediments to competitive natural gas markets in California. FERC requires interstate pipeline systems to offer firm open-access transportation and storage services on their systems. If electric generators and other non-core large users of natural gas had firm rights on the intrastate pipeline system, they would be able to acquire available firm capacity on interstate systems moving to California and negotiate reasonable prices from the producers or marketers supplying natural gas. This is the basic objective of any open-access program. It is my understanding that the CPUC has proceedings before it at this time which could result in the creation of firm tradeable intrastate rights, and I look forward to seeing a resolution to this issue.

Another issue that I believe FERC must address is whether to reimpose the maximum rate ceiling on short-term capacity releases into California. On May 22, 2001, we issued an order on a request for relief filed by several parties. The request is based on the assumption that high prices of natural gas delivered at the California border are due, in part, to the ability of persons selling to the California market to charge above the interstate pipeline's maximum tariff rate for the release of pipeline capacity. The

May 22 order sought comment on whether the price cap should be reimposed in California, and whether it should be extended to pipelines delivering into the WSCC region. I had reservations about the release of the price cap in FERC Order No. 637, and I therefore advocated strongly to release the price cap as an experiment, with a September 30, 2002 sunset date. This is the approach we took. I now believe that suspension of this experiment may be appropriate in an environment of highly volatile prices.

Finally, it is important to note the allegations of abuse of market power, affiliate preference and withholding of capacity on the part of El Paso Pipeline Company and its affiliate, El Paso Merchant Energy Company. The CPUC maintains that an El Paso Merchant contract, which accounts for approximately one-third of its affiliate's capacity into California, allowed El Paso Merchant to exercise market power and artificially drive up the price of natural gas transported to California. On March 28, 2001, FERC set the issues of market power and withholding for hearing. Subsequently, on June 11, 2001, we expanded the scope of the hearing to include the issue of affiliate preference. The importance of this case can not be overstated, not only for the dollars involved, but also for the Commission to get a better understanding of the events and causes of the significant increase in natural gas prices over the past year.

In conclusion, I am confident that the Commission has taken the appropriate actions at the appropriate time to address the market distortions in California. Our actions have built upon the market-oriented approach that this Commission has been committed to for nearly a decade. In addition, our remedies have been designed not only to help alleviate the extreme high

prices borne by Californians and others in the West, but also to ensure that sellers continue to have incentives to sell into the western states and to build sorely needed new generation and transmission necessary to provide reliable service in the future. I have been pleased by the early results of our mitigation efforts. However, I am committed to continue to take all reasonable and appropriate actions required to ensure that these electricity and natural gas markets are operating in an efficient and fair manner and produce prices that are just and reasonable. That has been my goal all along and it continues to be what guides me every day at the Commission.

Federal Energy Regulatory Commission**Statement of Commissioner Linda K. Breathitt****Order on Rehearing of Monitoring and Mitigation Plan for the California Wholesale Electric Markets, Establishing West-Wide Mitigation, and Establishing Settlement Conference****June 18, 2001 Commission Meeting**

I fully supported the Commission's actions on April 26 in establishing market-based price mitigation for sales in the California ISO's spot markets and instituting a West-wide FPA section 206 investigation into the reasonableness of rates in the WSCC spot markets. It was my fervent hope that the April 26 order would have a dampening effect on prices in California and the West, and it appears that prices have dropped significantly since the price mitigation and must-sell requirements took effect on May 29. During the week ending June 9, prices for spot purchases of power at Western trading hubs fell to less than \$55 per megawatt/hour from a high of about \$170 per megawatt/hour earlier in the week. The low prices continued into the next week. Equally important to me, the price for longer-term contracts also has come down dramatically. We have seen forward contracts for 2003 drop to \$41 per megawatt/hour in the past month.

I highlight the price for long-term contracts because of the over reliance on spot market purchases, which the December 15 order cited as a key factor for continuing high prices in California. California has made notable progress in long-term contracting, and I view this as a crucial objective. Spot market

purchases of power for on-peak requirements are down from one hundred percent in December to around twenty percent this summer. I view the shrinking reliance on spot markets, as well as the mitigation and other remedies from our April 26 order, as critical factors in the recent decline in energy prices in the West.

The Commission is establishing a market monitoring and mitigation plan that is designed to produce prices in all hours that are just and reasonable and to emulate prices that would be present in a competitive market. The distinguishing characteristics of today's order are the establishment of a mitigation plan for all hours in California and the extension of this mitigation approach to all states in the WSCC. Based on the comments we received and based on prices that we recently have observed in California in hours when there is no reserve deficiency, we conclude that as an added measure in protecting consumers, at this time it is also appropriate to require a type of price mitigation in all other hours. The purpose of this dual plan is to stabilize the market in the short-term and permit California to repair its market mechanisms. The mitigation plan, in effect, is intended to provide breathing room for the markets to correct themselves. Importantly, the mitigation plan announced today will apply to all sellers, including marketers and non-public utilities across California and the balance of the U.S. portion of the WSCC. I fully support the premise of today's order, which is that all sellers should be treated alike to remove the incentive to sell in one area versus another

when an emergency is called by the ISO. In prescribing price mitigation for spot markets throughout the West, it is the objective of the Commission to guide the WSCC's energy markets through the difficult process of self-correction.

The discretionary mitigation methodology that will be implemented as a result of this order provides price protection during non-reserve hours while allowing for prices to continue at the low levels we have seen since our April 26 mitigation order was implemented on May 29. In essence, the price mitigation for non-reserve hours sets a reasonable cap on prices during those hours. Prices in non-reserve hours should not, in general, trend above the mitigated price for reserve emergencies.

I strongly advocated the establishment of a west-wide section 206 proceeding to investigate the high prices occurring in states outside of California. Consequently, I am very pleased that this order extends the mitigation plan to all states in the WSCC. Importantly, sales both in and outside of California will be treated uniformly by all sellers using interstate transmission. This last feature is fashioned to address concerns raised about "megawatt laundering" - where a supplier schedules out of state and then re-imports that power to avoid a mitigated price. The markets in the Western states merit the same protection that we are affording California. It is also reasonable to extend the mitigation plan for California and the Western states through the summer of 2002 to give a reasonable

time period for supply to enter the market. It is estimated that there could be nearly 7,000 additional MW on line by the summer of 2002. I believe that these pragmatic changes to the market structure and rules will ensure that future rates will be just and reasonable.

I support the mitigation approach adopted through this order because it contains the market features that I believe are critical to helping remedy the market design flaws while still encouraging new investment in infrastructure and protecting consumers. Remedies for market design flaws and mitigation of prices go only so far to address problems facing California and the West. We also need an approach that will help ensure that adequate infrastructure is built to address genuine shortages of supply.

While I wholeheartedly encourage conservation and embrace demand reduction mechanisms, we need to acknowledge that due to several factors - obsolescence, shifts in usage patterns and continued growth in consumer demand - the natural gas and electric infrastructure in the West must be expanded and upgraded. I believe that the market-oriented approach we take through this order will provide the price mitigation needed while not discouraging necessary investment in supply.

The order makes several modifications to the methodology used to set the proxy price during reserve emergencies. The order acknowledges that emissions

costs are a legitimate cost of producing energy in California. However, there is not a uniform approach to the treatment of NO_x emissions in the 35 air quality districts within California. The NO_x variable becomes even more complicated because in this order, the mitigation is being broadened to all WSCC states, where emission costs are relatively low. Consequently, this order directs the ISO to develop a specific emission allowance charge that will be assessed against all load on the ISO's transmission system. The Commission is also modifying the O&M adder to reflect costs that are more representative of the units that are currently operational in California.

The order modifies the calculation of the gas cost used in the proxy price. While some parties have argued that the gas costs calculated for the proxy price are too high, generators have asserted that the average is insufficient for them to recover their gas costs. The use of the average gas costs balances these concerns while allowing the generators a reasonable opportunity to recover their costs within an administratively feasible framework. I continue to be concerned about the persistent high gas prices in Southern California. As I have stated on numerous occasions, there appear to be a number of reasons for these higher gas costs, including a shortage of infrastructure and the lack of firm entitlements on intrastate systems. However, not allowing generators to have the opportunity to

recover prudently incurred gas costs would be punitive and, therefore, inappropriate.

Today's order also instructs the ISO to impose a ten percent creditworthiness surcharge to the market clearing price. This is a modification that I do not endorse and will be issuing a concurrence to express my views on this aspect. The imposition of such a credit surcharge virtually concedes to the ISO the issue of whether or not the ISO must implement the Commission's creditworthiness standards. The parties' argument for the inclusion of such an adder is that the risk of non-payment in California continues to be greater than that in the larger West-wide market. The order instructs the ISO to add ten percent to the market clearing price paid to generators for all prospective sales.

I agree with my colleagues that creditworthiness and non-payment of accounts are serious problems in California. I believe the Commission and the ISO must take immediate steps to address these problems. However, I am concerned that the credit surcharge imposed by today's order is premature. Therefore, I will be concurring on this limited issue.

Finally, I would like to state my support for the settlement conference that will be established through this order. I am keenly aware of the difficulties that the parties face and the compromises that will need to be made to fashion a comprehensive settlement. However, the settlement process is an invaluable tool

for resolving contentious issues in an equitable manner. I have long been an advocate of negotiated resolutions and encourage all parties involved, including the State of California, to work together at the daunting task of settling past accounts and structuring new arrangements. If progress is made within the fifteen days provided by this order, I keep an open mind to granting reasonable extensions should the presiding ALJ request more time.

In conclusion, I am confident that the Commission has taken the appropriate actions to address the market distortions in California. I am pleased that our mitigation plan will now be extended to the other states in the WSCC. Our remedies have been designed to help alleviate the extreme high prices borne by California citizens and others in the West. But they have also been designed to ensure that sellers have incentives to sell into those states and to build sorely needed new generation and transmission necessary to provide reliable service in the future. Meeting these goals within a market-oriented framework is an approach that I endorse.

Thank you.

**Testimony of
Commissioner Nora Mead Brownell
Federal Energy Regulatory Commission
Before the Committee on Governmental Affairs
United States Senate**

**Washington, DC
June 20, 2001**

Mr. Chairman and Members of the Governmental Affairs Committee:

Thank you for the opportunity to appear before you today. The state of retail and wholesale electricity markets in the West has been headline news on a daily basis for the last six months. California's experience has been in the forefront, but clearly, the problems – as well as the solutions – are regional in nature. Indeed, it is a tragedy for everyone in the West, and a matter of grave national importance.

I should take this opportunity to emphasize something that I stated during my confirmation hearing. My appointment to the Federal Energy Regulatory Commission did not arise because I have all the answers. I can offer no panacea. Unfortunately, that has not changed since I was sworn in last week. I am committed to working with you, your colleagues in the House of Representatives, the State of California, market participants, consumer groups, environmentalists, and other interested groups to arrive at solutions.

Over the past year, I have been constantly aware of the very divergent experiences that my home state, Pennsylvania, has had with its markets from the experiences of California. During this time, I have been repeatedly asked what made Pennsylvania's market different. Both California and Pennsylvania have been high-cost states, that

moved to de-regulated markets. I would first like to briefly comment on what could possibly account for the the different results, and then discuss what I see as possible lessons that we can use in the future.

Many factors have resulted in differences between Pennsylvania and California, including sustained economic growth in California and other Western states that has caused demand to exceed supply. This imbalance has been exacerbated by California's internal policies on generation siting and environmental restrictions, which have led to few, if any, additions to generation. The region is highly dependent on hydroelectric power, which, when combined with one of the most severe droughts experienced by the Northwest region in history, has led to a reliance on relatively more expensive replacement power. California is also dependent on imports from other states in the region, with as much as 20 percent of its peak demand being met through imports. As the drought has affected the entire region, this reduced the amount of supply available for imports to California.

In short, the net affect of all these factors is that supply is insufficient to meet demand. If I may borrow a statement of Commissioner Wood, when you have insufficient supply, the supply and demand curves meet in funny places.

The inadequacy of the transmission grid has also contributed to these problems. There has been very little transmission enhancement to support the economic boom in the West, and the increased demand associated with it. Again, difficulties in siting and environmental restrictions are associated with a failure to enhance, upgrade, and enlarge

the regional transmission grid. The siting of transmission facilities subject to multiple state and local entities is complex and subject to delays. For the most part, the region itself is not represented, so local concerns predominate. I would emphasize that the interstate transmission grid is truly regional in scope and operation and we must work toward a regional approach to planning and siting.

The lack of transmission infrastructure enhancement and regional cooperation with regard to transmission siting, upgrading, and operations, has resulted in significant constraints in California's grid. Accordingly, even if we can add new generation resources quickly, it is still not clear that these resources could be directed toward load in the most efficient manner, given current transmission constraints. Generation and transmission must be linked, if we are to succeed in addressing these problems. This is true with regard to gas infrastructure development as well.

I am frequently asked to address the "failure" of regulation which some contend is evident from California's experience. As a preliminary matter, I would like to emphasize that while I do not necessarily agree with all the decisions made in California, I heartily applaud the state and its lawmakers for initiating retail restructuring and for doing so at time when there were few, if any, models. In the long term, the welfare of the American consumer will be significantly increased by the development of workably competitive electricity markets, and California was among the first states to understand this concept and work to achieve it. Pennsylvania learned from California's experience, and has devised a different model. Texas moved even further and improved on what had gone

before. I do not say this to criticize California, but only to emphasize that there are different approaches to deregulation, and we must be responsive to differing regional circumstances.

It appears, in retrospect, that California's market design lacked the necessary flexibility to respond quickly when there was insufficient supply. To make matters worse, natural gas is a major fuel source, and its prices have escalated substantially. California also required divestiture of utility generation assets and forced its utilities into the spot market, a volatile market of last resort. This reduced the utilities' opportunities to manage their business and for procuring power supplies from all possible sources, including on a long-term basis, a critical component of a workably competitive market. Once natural gas prices rose, and supplies fell, there was simply no means by which the utilities could develop supply portfolios that "managed around" the increasingly volatile spot market.

Pennsylvania, however, had a significantly different environment. First -- and perhaps most importantly, Pennsylvania's deregulation operated against a supply surplus. The resource generation fuel mix was not subject to weather-related shortages, as hydroelectric power is. While the regional grid has some import capabilities, imports are not essential to meet demand.

In addition, to adequate supply, the ISO that controls the grid in Pennsylvania's region ensure that the grid operates in an independent fashion. There is substantial regional planning, which not only ensures that generation supply would keep pace with

demand, but also eases transmission siting problems and reduces uncertainty with respect to generator interconnection procedures. While local issues and debate are not eliminated, regional planning better manages this issue by allowing a certainty of process and solid engineering approaches to grid enhancement. This, in turn, helps attract investment, a critical feature to maintaining competitive markets. The ISO also manages a well-designed, market-based congestion management system, that, by allowing parties to "buy their way through" constraints, allows them to pay their true economic price for use of the grid. This kind of market-based response to constraints also helps attract investment.

Pennsylvania's market design was designed to encourage all participants into the competitive market. While there were mandatory rate cuts, the bulk of Pennsylvania's market design focused on creating incentives for consumers to enter the market, as well as suppliers. To achieve these goals, Pennsylvania's market supply requires consumers to explore options in the market in order to achieve the full extent of possible savings. Also, Pennsylvania did not restrict utilities from using market-based tools to protect themselves against market volatility and did not require generation divestiture. The utilities were free to make such decisions as part of their individual business plans.

I should add that Pennsylvania had the decided advantage of launching competition only after the regional ISO has up and running. The ISO performed test runs of the regional energy commodity market before Pennsylvania's deregulation initiative started. Over time, additional markets have been created, and are now operating, which

provides for competitive approaches to power supply, including delivery to ultimate customers. None of this would, however, be successful unless the ISO is truly independent, operationally sound, and operates a significant portion of the region.

Moreover, the ISO that manages Pennsylvania's grid performs a market monitoring function, which did not exist at the time that Pennsylvania launched its program. However, it soon became clear that monitoring is essential to ensuring that developing electricity markets have the opportunity to mature and remain healthy. It is clear from Pennsylvania's experience that the ISO must have adequate access to all necessary market data, and understand how to interpret, and respond to, such data. Market monitoring plays a critical role in ensuring workably competitive markets, and resources should be devoted to its development.

These are some of the key differences that I see between California and Pennsylvania. One thing that they do have in common, however, are limited demand response programs. For the most part, consumers in both states still see one average price for their power. California has recently significantly increased its prices, and has seen a substantial reduction in demand. While that is an important step, consumers are still blind to pricing and cannot react on a real-time basis. Because it is estimated that demand response of very small proportions can have a real effect on market prices, demand response programs are a necessary component of a successful transition to competition. I am aware of several experimental demand response programs that have achieved promising results. As the marketplace becomes more familiar with these tools,

and demand for the technology increases, investment will begin into this area, and better results will be achieved. Customers are smarter than we give them credit for. They will use the tools that we give them. We must work to bring these and other new technologies to market quickly.

I would now like to focus attention on what lessons I take from my experiences in Pennsylvania, and my understanding of the differences between California and Pennsylvania. First, I strongly believe that a comprehensive, regional approach is the key to solving our current problems, preventing future problems, and achieving our goal of competitive, seamless markets. We must focus on both the electric and gas markets. We must involve the states and other federal agencies and departments. To that end, as an agency, we should better communicate with regional stakeholders and improve regional coordination to develop a more comprehensive and permanent solution to today's energy problems. The ISO that has been a factor in Pennsylvania's transition to competition is a regional grid operator, which has enhanced its ability to create solutions to regional supply problems. As I discussed earlier, the ISO is active in regional transmission planning, a key component in long-term transmission constraint relief. This is just one example of how important a regional approach to problem-solving can be in the maturation of energy markets.

I intend to explore such creative approaches as the development of regional oversight committees, which can work with the existing regional coordination councils and other similar entities, including state regulators, to better assist the development of

workably competitive markets across the country. I believe that the Commission can structure itself to better understand, and respond to, state and regional concerns. It is clear from both the California and Pennsylvania experience that regionally-based solutions are critical to preventing, or solving, supply and demand imbalances.

Second, I believe that the Commission must commit itself to effective market monitoring, both monitoring that it performs itself and that performed by ISOs or RTOs. An ongoing market monitoring program is necessary to plan and decide strategically to ensure that our decisions promote competition and efficiency in energy markets. Market monitoring is also necessary to assist the Commission in carrying out its regulatory responsibilities in an environment of rapidly changing markets.

I intend to explore creative approaches to ensure an effective market monitoring program. One possibility is to tap the resources of other entities, public and non-public, that are experienced in market monitoring, such as the Federal Communications Commission, the Securities and Exchange Commission, the Federal Trade Commission, and the New York Stock Exchange. Senior managers from these entities could provide input on what data is needed for effective market monitoring, how to best use the data, and how to respond rapidly and decisively when the data indicates that problems are developing. We can benefit from the "best practices" of these entities in strengthening our market monitoring function.

I believe that the Commission must have timely and reliable data and information to have an effective market monitoring program. This is area where better

communication with regional stakeholders and improved regional coordination may lessen the burden and cost of data collection for both the Commission and the energy industries.

Third, I am also a strong advocate of truly independent, operationally strong ISOs and RTOs, whose scope is as broad as possible. One of the key lessons I take from the experiences in California and Pennsylvania is that workably competitive markets are more likely to develop and remain healthy when the grid operator is independent, is able to engage in effective market monitoring, and can plan on a regional basis, both with respect to transmission and generation. Moreover, the grid operator must have sufficient flexibility to rapidly respond to changes in the market as they occur. Anything else cannot achieve our goals of a transition to competition and deregulation.

I also learned from my tenure in Pennsylvania that regulators must act rapidly and creatively to ensure the successful development of competition. For example, Pennsylvania used alternative dispute resolution to settle all of its deregulation-related proceedings, thereby avoiding prolonged, expensive litigation. While we may not be able to settle all the deregulation-related proceedings pending at the Commission, I believe that we must actively explore the possibility of expanding our reliance on alternative dispute resolution, particularly with respect to proceedings involving deregulation. Moreover, this Commission must maintain open lines of communications with stakeholders, and keep an open mind with respect to their suggestions and concerns. Stakeholders bring to the table invaluable experience that regulators cannot readily

duplicate, and we should not deprive ourselves of that resource. No one person or entity knows all the solutions to the problems we have encountered in the developing markets, and we must tap all the resources we can to ensure that we move to workably competitive electricity markets as soon as possible.

Finally, I want to comment that we are all challenged with the task of transforming ourselves to respond effectively to the demands of transitional markets. We are creating the road map in the middle of the trip. I want to commend the staff, as well as my colleagues, for their enormous commitment and hard work. We may need new tools and we may need new skill sets, but I have found a strong desire to learn and a willingness to embrace change. Those are essential to making the system evolve successfully.

**Testimony of
William L. Massey, Commissioner
Federal Energy Regulatory Commission
Before the
Committee on Governmental Affairs
United States Senate**

June 20, 2001

Mr. Chairman and members of the Committee:

Thank you for the opportunity to testify about the actions taken by the Commission in response to the western electricity crisis.

The last comprehensive Commission order to address the crisis was issued on April 26, 2001. I dissented in part. In a statement before the Committee on Energy and Natural Resources on May 3, 2001, I outlined the rationale for my dissent. I have attached that statement and request permission to incorporate it in my testimony before this committee.

Throughout this crisis, the Commission's orders have been timid and insufficient to fulfill our statutory duty to ensure just and reasonable prices. The Commission's responses to the crisis, though well intentioned, can be fairly characterized as too little, too late. The crisis began in June, 2000. Electricity prices soared even higher after our December 15, 2000 remedies order, and our refund orders for the months of January

through April, 2001, have been paltry and arbitrary. The April 26 order, though somewhat more aggressive, provided a measure of price protection for consumers only during periods of severe generation reserve deficiencies (so-called stage 1, 2, and 3 alerts). The order also initiated an extraordinarily narrow section 206 investigation into electricity prices in the Western Interconnection.

These measures are insufficient to fulfill our statutory duty to ensure just and reasonable prices. This standard applies 24 hours a day, 7 days a week, not just during reserve deficiencies. The responsibility also applies to all wholesale electricity markets, including the Western Interconnection.

Fortunately, wholesale prices have abated somewhat during June. It is impossible to predict, however, what prices will be next hour, tomorrow or next month. This is still a broken, capacity short market. Based upon our experience with this market, we know that prices can soar at the drop of a hat to unreasonable levels.

Thus, additional steps are necessary to ensure just and reasonable prices. The Commission must impose reasonable price controls throughout the Western Interconnection during all hours. It may be appropriate to exempt new generation

brought on line in the future so that there is no deterrent to entry. There should be no loopholes in these controls, and any form of gaming, manipulation or withholding of capacity (whether physical or economic) should be strictly prohibited. The controls should extend for 18 to 24 months to allow time to fix the broken market and to install necessary power plants.

The Commission has scheduled a special meeting for 1:00 PM on June 18. I will be advocating that the Commission at that meeting address the issues I have raised.

Thank you for this invitation to speak, and I will be pleased to respond to any questions.

Attachment

**Testimony of
William L. Massey, Commissioner
Federal Energy Regulatory Commission
Before the
Committee on Energy and Natural Resources**

May 3, 2001

The Commission's April 26 order was perhaps the last clear chance to put in place adequate measures to protect consumers in California and other parts of the western market from runaway prices this summer. There are many good features to the order that could prove helpful this summer and beyond. But the order is deficient in critical respects and consequently will fail to achieve our objectives. Because of these restrictions, I dissented in part from the order.

We are now eleven months into the California calamity. It has had a breathtaking and staggering effect on the western economy, and there is no end in sight. Now is not the time for half-a-loaf solutions. I was not willing to compromise my vote so cheaply. Our December 15 remedies order did not contain the effective price relief I championed, or anything close to it. It is now over four months and many billion dollars later. Since then our refund orders have been paltry and, in my opinion, arbitrary. Prices are not just and reasonable now and will not be this summer, and the economic carnage is spreading throughout the western interconnection. For example, four hundred and six workers were put out of work when Georgia Pacific shut a production facility in Bellingham,

Washington, because of skyrocketing electricity bills. The Seattle-Tacoma Airport estimates that this year, its electric bill will triple to \$50 million, skyrocketing to 25% of its operating budget. Countless other examples of economic harm throughout the western interconnection could be cited. BPA may increase its rates by a whopping 250%. The point is that now is the time for effective problem solving, and this order, though it has some salutary features, falls far short.

There are four aspects of the order to which I dissented.

First, the price mitigation feature is too restrictive because it is applied only when an operating reserve emergency is called. Effective price mitigation should apply during all hours in California. Such an approach would not be the least bit punitive. It would, in fact, replicate the manner in which the single price auction is supposed to work, that is, the single price auction theoretically provides a powerful incentive for generators to bid their running costs into the market. That is the most effective generator strategy for ensuring dispatch, or so the theory goes.

The problem is that it has not worked that way in the California market. Economic withholding, which is bidding up the price well above costs just because you can, is a pervasive problem, and as a result, high prices that exceed a just and reasonable level are a severe problem in the California market. The record is devoid of any evidence

that the problem is limited to hours when an operating reserve margin alert at stages 1, 2, or 3 is in effect. The evidence is highly persuasive that the problem exists twenty four hours a day, seven days a week. I found the March 21 California ISO study by Dr. Anjali Sheffrin, the ISO's director of market analysis, to be compelling. Dr. Sheffrin concluded that economic withholding is a severe problem in all hours, not simply capacity constrained hours, and I agree. Her analysis concludes that from May to November 2000, withholding that led to inflated market prices in the ISO's real time market occurred in over 98% of hours. According to my calculations, the ISO declared a stage one, stage 2 or stage 3 alert in only 5% of the hours during this period. For Dr. Sheffrin's study period, the price mitigation proposed in our April 26 order would have missed 93% of the hours when market power drove up prices. Similar studies by Dr. Paul Joskow of M.I.T., and by Dr. Frank Wolak of Stanford, provide persuasive evidence of withholding and buttress Dr. Sheffrin's conclusions.

The solution is to require generators to bid their costs in all hours. This replicates the intent of the single price auction concept. What's more, the more efficient generators would still make money under such an approach, perhaps a lot of money, because the market clearing price that all generators get would be set by the highest cost generator, probably an inefficient older gas fired generator with a high heat rate.

Because the price mitigation feature applies only during operating reserve alerts, and not during other periods, I have no confidence that prices will be just and reasonable during all hours. This agency is statutorily required to ensure just and reasonable prices at all times, and this standard in federal law is not limited to stage alert hours.

Today's order also narrows the existing refund condition adopted in the December 15 order. I object to this.

Second, the duration of the monitoring and price mitigation features of this order is too restrictive. Today's order would expire one year from now unless expressly modified by the Commission. This period of time is too short. I would allow the monitoring and price mitigation features to remain in place for at least eighteen months, and perhaps 24 months.

Third, I object to the RTO filing conditions. Under the order, if the California ISO and the three California investor-owned utilities fail to make an RTO filing by June 1, the entire order is of no effect. As I read it, this order becomes null and void. This makes no sense. It seems to stand for the proposition that this agency will make no effort to ensure just and reasonable prices if the California ISO and all three of the California IOUs fail to make an RTO proposal. I cannot support such a condition. The California

ISO and the three utilities must make an RTO filing, but this has no relevance to price mitigation over the next year.

And fourth, the scope of the section 206 investigation that is ordered for the Western Interconnection should be substantially broader. I concurred to our December 15 order, and advocated that the Commission initiate a section 206 investigation into jurisdictional wholesale sales for the entire Western Interconnection, setting a refund effective date 60 days hence. As a legal matter, such an investigation is a necessary predicate to any possible price relief outside of California's spot markets.

This order opens an extraordinarily narrow 206 investigation for the Western Interconnection, and I commend my colleagues for at least going this far, but the approach is much too narrow to hold any promise of effective price relief. I had advocated an investigation, and refund condition, for all transactions of one month or less. The investigation and refund condition set out in this order only apply, however, to transactions of 24 hours or less that occur during a reserve deficiency of 7% or less. The investigation and refund condition are so narrowly circumscribed that they do not hold the potential for meaningful price relief. It is my understanding that many of the transactions that are driving the high prices in Washington, Oregon and other western states are for terms well exceeding 24 hours. This type of transaction would not be subject to this investigation nor to price relief. I object to this omission.

Finally, let me underscore my great concern about the high price of natural gas delivered into California markets. The transportation differential into California often exceeds ten dollars, and is often substantially more at various intrastate delivery points. The transportation differential into other large markets such as New York and Chicago is usually less than a dollar, and sometimes no more than a few cents. The high cost of natural gas delivered into California is then used to justify high wholesale electricity bids into the ISO market. An inefficient, high heat rate, generator using a considerable amount of high priced natural gas then sets the market clearing price that all sellers are paid. Thus, the high transportation differentials into California gas markets have a particularly pernicious effect when coupled with a single price auction for electricity.

I urge this agency to take all available action to mitigate these high transportation differentials. We must actively explore any jurisdiction we may legitimately have that affects the so-called gray market. We must take a second look at whether lifting the price cap for secondary market pipeline capacity was in the public interest. We must vigorously investigate any allegations of withholding or market manipulation or affiliate abuse. We must certificate new interstate capacity that is needed for the markets to function efficiently, and, as Commissioner Breathitt has pointed out on more than one occasion, we must work with the state of California to ensure that there is adequate take away capacity in the intrastate market. I am open to any and all ideas, but my attention was riveted on this issue by our recent staff order setting the so-called proxy price for

electricity for the month of February. The proxy clearing price was \$430 per Mwh, and roughly \$350 of that amount was the price of natural gas for an inefficient generator. I concluded that electricity prices in California would remain very high if based upon a very high price for natural gas. This issue has not gotten nearly the attention it needs, and I highlight it to urge more forceful Commission action in this area.

Our April 26 order is only the latest in a series of actions the Commission has taken with respect to the problems facing the California and western markets. Despite the hard work of our excellent staff on these matters, the actions of this agency, though well intentioned, have fallen short of ensuring just and reasonable prices. True, we cannot solve all of the west's energy problems. A large share of the responsibility falls on state and local government entities. We can, however, insist that wholesale prices are just and reasonable in all hours. Indeed, we must do so. Under federal law, that is solely our responsibility and no one else's.

We face the second summer of out of control electricity prices out west. This may be our last chance. We should have seized it fully. Because we failed to do so, I dissented.

**Testimony of Pat Wood, III
Commissioner, Federal Energy Regulatory Commission
Before the Committee on Governmental Affairs
United States Senate
June 20, 2001**

The vitality of the nation's electric power industry is critical to the national economy. Since the passage of the 1992 Energy Policy Act, the Federal Energy Regulatory Commission (FERC), together with our sister state commissions, has come to play an increasingly important role in managing the transition from a world of traditional monopoly regulation to one more governed by market forces.

Prior to my appointment to the FERC two weeks ago, I was Chairman of the Public Utility Commission of Texas. Due to the wholly intrastate nature of the grid of the Electric Reliability Council of Texas (ERCOT), one of the nation's three electrical interconnections, my colleagues on the Texas Commission and I had a role overseeing the development of the wholesale markets in ERCOT that is very similar to the role FERC plays overseeing the wholesale markets utilities in the other two interconnections. (Utilities within ERCOT serve 85 percent of customers in Texas; the other 15 percent of customers are served by FERC-jurisdictional utilities.) In addition, like other state commissions, we also regulated the retail rates and services of all investor-owned utilities serving Texas customers.

The lessons I have drawn from my six years on the Texas Commission are basic: Deregulation won't work without competition. And competition won't work without sufficient infrastructure and balanced market rules.

In implementing Congress' 1992 mandate to open up wholesale electric markets, the FERC must focus first on the sufficiency of infrastructure and on the market rules governing a competitive market. Infrastructure is a broad concept, encompassing both power generation plants (large and small), demand-side resources and the power delivery grid. Oversight of the infrastructure is a shared state-federal responsibility. Development and enforcement of market rules is primarily a FERC responsibility, but it, too, involves state commissions.

Maintenance of sufficient infrastructure and oversight of the market is an ongoing job. In Texas, the market has been opened in stages. First, in 1995, the Texas Legislature and Governor Bush fully opened the electric generation market to non-utility companies. In 1996, the Texas Commission mandated the nation's first Independent System Operator (ISO) to alleviate market power concerns with transmission facility ownership by competitors in the generation market. In 1997 and 1998, the Texas Commission adopted standard rules and tariffs to speed development of generation (both large and small-scale) and transmission. In 1999, the Texas Legislature and Governor Bush directed the Texas Commission to open the retail sales markets to competition by January 1, 2002. Immediately following passage of the 1999 legislation, we focused on adapting the ERCOT wholesale market structure to one accommodating competitive retail sales, as well as establishing the parameters for retail competition. In 2000, the Texas Commission established a Market Oversight Division within the agency to serve as a

market cop for the future opened market. Having the full span of activity under one regulatory roof gave Texas the comfort that its transition to a fully competitive market will be beneficial for its citizens.

From that Texas experience, I feel it is absolutely crucial that the FERC be a trusted and capable partner with our sister state commissions as they move to a more competitive model. No state will venture into a competitive future if it does not believe that its market opening efforts will be backed up by its federal partner. Vigilant, and collaborative, oversight of the various regional power markets is the most significant role the FERC will play in coming years.

First, as noted above, the basic ingredients for competition have to be in place: sufficient supply-side and demand-side resources and a robust delivery infrastructure. State and federal regulators have a role to play in ensuring that the right business incentives are in place to stimulate continued development of these resources. Balanced market rules are the other basic ingredient for competition. In Texas, we encouraged interested parties from all aspects of the industry to develop ERCOT's market rules. The Texas Commission then reviewed those protocols with the assistance of outside experts to ensure they best satisfied the public interest. With some modifications, those market rules were approved earlier this year. The FERC has played a similar role in development of various regional market structures and rules.

Second, once the basic ingredients are in place, and provided they remain in place, regulators move into an oversight role. As with other major commodity markets, it is necessary that regulators be active and visible, reviewing daily transactional data, auditing market players for compliance with market rules, responding swiftly promptly to complaints. Where necessary, oversight may require that market rules be amended. This should be approached cautiously, as participants will have made investment decisions based on previous rules. All of these oversight responsibilities require regulatory commissions to develop new skill sets and revamp decisionmaking processes.

Attracting and retaining a high quality professional market oversight staff must be a top priority of the FERC. I can think of few positions in federal government where so much is at stake and where professional skills are so badly needed. During my term at FERC, one of my chief priorities will be to work with my colleagues to strengthen our existing market oversight professional staff and recruit high-caliber experts (both permanent staff and outside experts) for our team. The nation's electric customers deserve nothing but our best effort in this.

Finally, a word about enforcement tools for violation of the market rules. Administrative fines are generally more effective as reputation tarnishers than they are in deterring undesired, but profitable, behavior. On the other end, permanent certificate revocation is an economic death penalty. In between, however, the FERC has some potentially effective tools to use in its oversight of the electric markets. The revocation of

market-based pricing, but not of the entire marketing certificate, is such a tool. Similarly, shorter term certificate revocation may be effective. With additional statutory authority, the FERC could also enhance administrative fines with punitive sanctions. Where markets are concerned, the watchdog's bite needs to match his bark.

I look forward to working together with my colleagues and with you to ensure that the FERC performs its energy market oversight duties consistent with the vision of Congress.

Prepared Testimony of

David N. Cook, General Counsel
North American Electric Reliability Council

Hearing Before the United States Senate
Committee on Governmental Affairs

June 28, 2001

Summary

The North American Electric Reliability Council (NERC) firmly believes steps must be taken now to ensure the continued reliability of the electric transmission system if the Nation is to reap the benefits of competitive electricity markets. The changes taking place as the electric industry undergoes restructuring are recasting the long-established relationships that reliably provided electricity to the Nation's homes and businesses. Those changes will not jeopardize the reliability of our electric transmission system IF we adapt how we deal with reliability of the bulk power system to keep pace with the rest of the changes that the electric industry is now experiencing. NERC and a broad coalition of state, consumer and industry representatives are supporting legislation that would transform the current system of voluntary operating guidelines into a set of mandatory and enforceable transmission system reliability rules.

NERC is a not-for-profit organization formed after the Northeast blackout in 1965 to promote the reliability of the bulk electric systems that serve North America. It works with all segments of the electric industry as well as customers to "keep the lights on" by developing and encouraging compliance with rules for the reliable operation of these systems. NERC comprises ten Regional Reliability Councils that account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

Reliability

Reliability means different things to different people. For the consumer it could mean, "Does the light come on when I flip the switch?" Or, "Does a momentary surge or blip re-boot my computer or cause me to lose a whole production run of computer chips I was manufacturing?"

NERC defines the reliability of the interconnected bulk electric system in terms of two basic and functional aspects, "adequacy" and "security." *Adequacy* means the ability of the electric system to supply the aggregate electrical demand and energy requirements

of consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of generators and transmission lines. *Security* means the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated failure of generators or transmission lines. As the electric industry restructures and competition increases, we must address both the adequacy of the bulk electric transmission system and our continuing ability to operate that system securely.

How the System Works

California's experience with electricity has focused peoples' attention on electricity issues in ways they never have in the past. Because of that increased awareness, we can draw on the California experience to understand more about how the bulk electric system really works. California is not an island; it is part of a much larger grouping of electric systems that we refer to as an Interconnection. The North American grid is divided into three Interconnections. The Western Interconnection includes not only California, but also the rest of the United States from the Rocky Mountains to the Pacific coast, as well as the Canadian provinces of British Columbia and Alberta, and a portion of Baja California Norte, Mexico. The Eastern Interconnection includes not only most of the United States east of the Rocky Mountains, but also Canadian provinces from Saskatchewan through the Maritimes. The third Interconnection comprises the Electric Reliability Council of Texas. Attached to my testimony is a map depicting the three Interconnections. The map also shows the ten NERC Regional Reliability Councils.

Each Interconnection is a single very large machine. Power flows freely throughout the grid in each of these Interconnections—there are no valves or switches. With very limited exceptions, there is no ability to direct power flows over a particular line; instead, power flows over all lines in the system, according to the laws of physics. All generators within an interconnection are magnetically linked, in effect as though all the generators are on a single shaft—all rotating at the same speed (think of a tandem bicycle—the front and back pedals are linked together by a chain, and rotate at the same speed; if one rider takes his feet off the pedals, the other rider has to work harder to maintain the same speed). What happens on one part an interconnection affects the entire rest of the interconnection. The frequency of the system in British Columbia is the same as the frequency in Arizona, and also at all points in between. When the frequency declines, because a large generating unit trips off, the rest of the generators automatically and instantaneously work harder to serve the customer demands.

The interconnected nature of electric system operations makes possible the transfer of power from one area to another for economic reasons as well as sharing resources in emergencies. California is a summer-peaking area, and it normally imports surplus power from the Pacific Northwest in the summertime to augment its own generating resources. By contrast, the Pacific Northwest is a winter peaking area, and it normally imports surplus power from California in the wintertime. That isn't happening this year. Load has grown throughout the West, and other regions have less power to export to California. In addition, the Pacific Northwest and California both depend

substantially on hydroelectric power. Severe drought conditions this year have seriously depleted the ability of the hydroelectric plants to produce energy.

California has also demonstrated the limits on the transmission system. Path 15 is a major transmission link between Southern and Northern California. Earlier this year, on some days the California Independent System Operator had to curtail firm load in Northern California, even though additional generation was available in Southern California to meet the load. Path 15 was loaded to its maximum safe reliability limit and there simply was no way to move additional energy into Northern California without risking the reliability of the entire Western Interconnection.

Interconnected operations also mean that a disturbance occurring in one part of an Interconnection can have adverse effects throughout the Interconnection. The 1996 Western outage that affected San Francisco, Los Angeles, and the desert Southwest and shut down the Diablo Canyon nuclear power plant started with a tree contacting a power line in Idaho. And whether an individual state chooses to open up to retail competition or not, the electric systems in those states are still connected together, and dependent on one another, as part of one Interconnection.

The grid is generally operated in a first contingency mode, that is, so that the grid can withstand the loss of its largest transmission line or generator and remain stable and secure. That means that all the remaining transmission lines will still be operating within their own limits and the system will remain stable and secure (meaning that the failure of a particular line or generator won't cause a cascading, uncontrolled failure of the entire grid). When a large transformer or generator fails or lightning strikes a power line, as happens as a matter of course, the grid can absorb that loss without causing other elements to fail. Operating in this manner preserves the stability of the grid, but it does sometimes place limits on the amount of power that can be moved from one part of the grid to another.

This is the area where NERC's rules operate, setting the standards by which the grid is operated from moment to moment, as well as the standards for how future transmission systems should be planned and designed. By planning I mean the things that need to be taken into account when one plans, designs, and constructs an integrated system that is capable of being operated securely. The NERC standards do not specify how many generators or transmission lines to build, or where to build them. They do indicate what tests the future system must be able to meet to ensure that it is capable of secure operation. Up to now, NERC's rules have generally been followed, but they have not been enforceable. As more entities become involved in the operation and use of the bulk electric systems, and use these systems to full competitive advantage, NERC is seeing an increase in the number and severity of rules violations. Hence the voluntary approach is no longer adequate for maintaining the reliability of the bulk power system. Just as the rest of the electric industry is changing, the reliability infrastructure must change, too.

NERC's formation was the electric industry's response to legislation that had been introduced in the Congress that would have given the then Federal Power Commission a central role in the reliability of the bulk electric system. Instead of adopting that legislation, the country opted for a voluntary industry effort. For more than thirty years it has worked very well, and we have had an extremely reliable electric system. But the reliability rules or standards have no enforcement mechanism. Peer pressure has been the only means available to achieving compliance.

As good as that system has been, as the electric industry restructures the voluntary system will not serve us well for the future. Here's why:

- The grid is now being used in ways for which it was not designed.
- There has been a quantum leap in the number of hourly transactions, and in the complexity of those transactions.
- Transmission providers and other industry participants that formerly cooperated willingly are now competitors.
- Rate mechanisms that in the past permitted utilities to recover the costs of operating systems reliably are no longer in place, or are inadequate given increased risks and uncertainties.
- The single, vertically integrated utility that formerly performed all reliability functions for an area is being disaggregated, meaning that reliability responsibilities are being divided among many participants.
- Some entities appear to be deriving economic benefit from bending or violating the reliability rules.
- Construction of additional transmission capacity has not kept pace with either the growth in demand or the construction of new generating capacity, meaning the existing grid is being used much more aggressively.

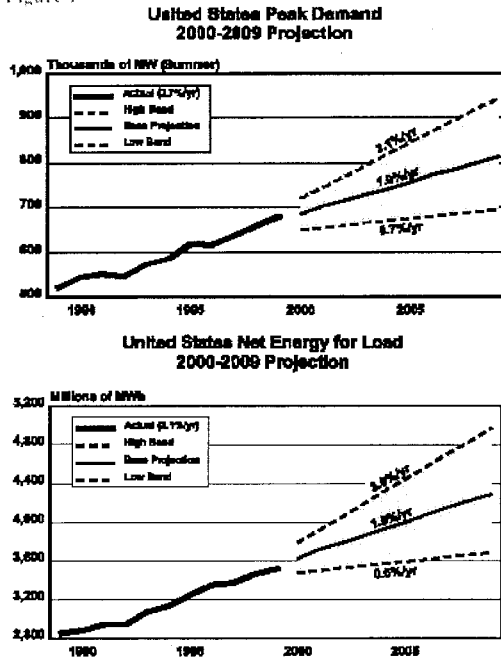
Not dealing with the reliability side of the business as the industry restructures would be like the airlines switching to jet airplanes without increasing the length of the runways.

What's Happening Now: Demand and Generation

A number of factors have contributed to our present circumstance. First, demand has been steadily increasing. The consensus projection for the average annual growth in both peak demand and energy use over the next ten years is a relatively modest 1.9%. (Figure 1.) "Demand" is a measure of the highest aggregate load that all customers place on a system at a particular point in time. "Energy use" is a measure of the total amount of electricity that all customers use over a certain period of time (e.g., one year). The projected growth in demand is similar to the projections of the last several years. High and low bands around the base forecast show a range of the forecast uncertainty to account for weather, economic growth, industry deregulation, and other factors. Both peak demand and energy projections are substantially below the actual growth rates experienced over the last ten years as demand has been driven by extreme weather at

peak times and a strong economy. Actual demand and energy growth rates experienced in the United States over the last ten years have been closer to the projected high band rate of about 3% for both demand and energy.

Figure 1



(Source: NERC Reliability Assessment 2000-2009.)

Second, in many parts of the country merchant generators are now building new plants to meet that increased demand, in response to the increased prices that we have been seeing in the wholesale electricity markets. During the past 10 years, generating capacity increased at the rate of less than 1% per year, even while demand was growing at the rate of 2.7% per year. That picture is changing, although in some parts of the country supplies will be tight for the next few years. Over 20,000 MW of new merchant capacity came on line to serve demand in the United States for the summer 2000. This year, New England has added another 2,300 MW. The Electric Reliability Council of Texas has added more than 6,000 MW. The East Central Area Reliability Council has

added more than 4,000 MW since last summer. A crucial 600 MW is being added within New York City and Long Island. While that story is not being repeated everywhere, even California, which is experiencing shortages now, is expected to have significantly increased reserve margins within a few years.

What's Happening Now: Transmission

The same is not true for transmission. Over the last 10 years, circuit-miles of high voltage transmission lines (230 kv and above) increased at only 0.75 % per year. Over the next 10 years we are projecting that circuit miles of high voltage transmission will increase a total of just 4.2 %, or a rate of less than 0.5 % per year. Stated another way, in North America 10 years ago we had a little less than 200,000 circuit-miles of high voltage transmission lines. Right now we have about 200,000 circuit-miles of those lines. And 10 years from now we are projecting that we will have just a little over 200,000 circuit-miles of high voltage transmission lines. For the most part, the transmission dollars that are being spent today are to connect the new generation to the grid—they are not going to build major new lines to strengthen the grid's ability to move large blocks of power from one part of the country to another. That lack of additional transmission capacity means that we will increasingly experience limits on our ability to move power around the country and that commercial transactions that could displace higher priced generation won't occur. And, it will mean that areas experiencing supply shortages, like California is now, won't be able to count fully on other areas with ample generating resources to help in emergencies.

Moreover, the existing grid is being pushed harder and is being used in ways for which it was not designed. Historically, each utility built its system starting in the city-centers, because the early generating stations were located close to load centers. As the cities grew, the electric systems grew with them, spreading outward from the center. The weakest part of the electric grid is generally at the places where one system abuts another. Initially utilities installed connections between two systems for emergency purposes and to share generating reserves to keep costs down. Gradually those interconnections were strengthened so that adjoining utilities could buy and sell electricity when one had lower cost generation available than did the other. But the systems were not generally designed to move large blocks of power from one part of the country to another, across multiple systems. Yet that is the way business is being conducted today. The volume and complexity of transactions on the grid have grown enormously since the advent of open access transmission.

Electric industry restructuring adds to the challenge. In the past a vertically integrated utility had complete responsibility for all aspects of its electric system, from planning and building the transmission system, through assuring that sufficient generation was constructed, to operating and maintaining the transmission and distribution systems, all to serve consumers in a designated area. With restructuring, there may no longer be a designated group of consumers for which to plan service. Instead, responsibilities to construct and maintain generation, transmission and

distribution are being divided among multiple entities and, in some cases, those responsibilities may be falling between the cracks. Regional Transmission Organizations may provide a means to reintegrate some of these functions. But the RTO proposals that have been filed to date vary considerably in the extent to which the RTO has the authority to plan and expand the transmission system, not only to connect new generation, but to meet broader needs of regional reliability.

The result of all this is that the transmission grid is being increasingly stressed. That stress shows up in two ways. **First**, NERC is seeing **more congestion** on the grid, for more hours of the day. Last summer in the Eastern Interconnection there were substantial transfers of power from north to south. Cooler temperatures in the north meant that surplus generation could be sent to the south where the temperatures were hot and natural gas prices were high. On many days security coordinators had to invoke NERC transmission loading relief procedures to curtail transactions that were overloading transmission facilities between north and south. For generation sellers, these curtailed transactions resulted in lost business. Buyers were forced to replace these transactions with higher priced power, or in some cases, to cut off power to certain "interruptible" customers. In addition, what do not show up are the transactions that merchants or marketers decided not to engage in because of the likelihood they would be interrupted. Today, we know that those same transmission facilities are fully subscribed for the coming summer, meaning we could see a repeat of last year's pattern if we experience similar weather conditions and fuel prices.

Second, NERC is seeing **increasing violations** of its reliability rules. As I mentioned earlier, the grid is generally operated in a first contingency mode, that is, so that the grid can withstand the loss of its largest element and remain stable and secure. Last summer there were a number of instances where operators allowed facilities to remain loaded above their known security limits for extended periods of time, placing the grid at prolonged risk of major failure. Some entities have made the economic judgment that it is less costly to them to violate the rules than to follow them. We have seen entities improperly "leaning on," or taking power from, the Interconnection, causing unscheduled and unmanageable flows and potential voltage problems. As the limits of the system are reached and transactions must be curtailed, we are beginning to hear suggestions to relax the reliability rules to allow higher flows to occur. In an interconnected system, however, taking increased risks to allow some entities to realize short-term economic gain affects not only the system where the limit occurs, but also all the systems in the same Interconnection. For example, in the 1996 outages in the Western Interconnection, customers far away from the initiating problems were interrupted for significant periods of time.

What's Needed

First, we need legislation to change from a system of voluntary transmission system reliability rules to one that has mandatory rules coupled with an enforcement mechanism backed by government. In August 1997 NERC convened a panel of outside

experts to recommend the best way to set, oversee and implement policies and standards that ensure the continued reliability of North America's interconnected bulk electric systems in a competitive and restructured electric industry. On a parallel track, in the aftermath of two major system outages that blacked out significant portions of the West in July and August 1996, the Secretary of Energy convened a task force on reliability, chaired by former Congressman Phil Sharp. Both groups came to the same conclusion: The current system of voluntary guidelines should be transformed into a system of mandatory, enforceable reliability rules, and the best way to accomplish that was to create an independent industry self-regulatory organization, patterned after the self-regulatory organizations in the securities industry, with oversight in the United States by the Federal Energy Regulatory Commission.

NERC and a broad coalition of state, consumer and industry representatives have been pursuing legislation to implement those recommendations. That coalition includes the American Public Power Association, the Canadian Electricity Association, the Edison Electric Institute, Institute for Electrical and Electronics Engineers—USA, the Large Public Power Council, the National Association of Regulatory Utility Commissioners, the National Association of State Energy Officials, the National Association of State Utility Consumer Advocates, the National Electrical Manufacturers' Association, the National Rural Electric Cooperatives Association, the Northwest Regional Transmission Association, the Transmission Access Policy Study Group, and the Western Interconnection Coordination Forum.

Goals of Reliability Legislation

- Mandatory and enforceable reliability rules, for
- All operators and users of the bulk power system in North America
- Fairly developed and fairly applied, by
- Independent, industry self-regulatory organization
- Oversight within U.S. by FERC
- Must respect the international character of the interconnected North American electric transmission system
- Regional entities will have a significant role in implementing and enforcing compliance with these reliability standards, with delegated authority to develop appropriate Regional reliability standards.

Role of FERC

Because of FERC's limited jurisdiction and authority, because of the international character of the North American grid, and because of the technical expertise required to develop and oversee compliance with bulk power system reliability standards, this is not a job that can simply be given to FERC. FERC does not have clear authority over reliability matters. Legislation that would have given FERC's predecessor, the Federal Power Commission, plenary authority over reliability matters was introduced in Congress

following the Northeast blackout in 1965, but that legislation was not passed. Instead, the electric industry took on responsibility for assuring the reliability of the interconnected bulk power system. NERC was formed in 1968 to lead that industry effort.

The most direct statement in the Federal statutes on this subject is found in section 209(c) of the Public Utility Regulatory Policies Act, and it provides only for the making of recommendations with respect to industry reliability standards:

The Secretary, in consultation with the [Federal Energy Regulatory] Commission, and after opportunity for public comment, *may recommend* industry standards for reliability, to the electric industry, including standards with respect to equipment, operating procedures and training of personnel, and standards related to the level or levels of reliability appropriate to adequately and reliably serve the needs of electric consumers. The Secretary shall include in his annual report—

- (1) any recommendations made under this subsection or any recommendation respecting electric utility reliability problems under any other provision of law, and
- (2) a description of actions taken by electric utilities with respect to such recommendations. (16 U.S.C. § 824a-2, emphasis added)

FERC also lacks jurisdiction over approximately one-third of the transmission facilities in the United States. It lacks jurisdiction over facilities owned by municipalities and state agencies, rural electric cooperatives that have Rural Utility Service financing, the Federal power marketing administrations (such as the Bonneville Power Administration and the Western Area Power Administration), the Tennessee Valley Authority, and utilities within the Electric Reliability Council of Texas.

A further impediment to FERC's acting directly on reliability matters is that the grid is international in nature. Because the grid is a single machine, it must be operated under a common set of rules. NERC is a private, international organization, as is the new electric reliability organization envisioned by the pending legislation. There is strong Canadian participation within NERC now, and that is expected to continue with the new organization. Having reliability rules developed and enforced by a private international organization, with oversight in the United States by FERC and with oversight by Canadian regulators in Canada, is a practical way to address the international character of the grid. Otherwise, U.S. regulators would be dictating the rules that Canadian interests must follow – a prospect that would be unacceptable to them.

Having an industry self-regulatory organization develop and enforce reliability rules under government oversight also takes advantage of the huge pool of technical expertise that the industry currently brings to bear on this subject. The interconnected grid is a very complex machine. Hundreds of industry volunteers take part in NERC's standards development and related activities. FERC does not now have the technical expertise and resources to take on that effort, and it would not be cost-effective for it to do so. FERC's strong competence lies in assuring fairness and openness of process and regularity of proceedings. The combination of industry technical expertise to work on

substantive reliability rules and FERC oversight to assure due process is an effective and efficient way to address the issues.

Status of Reliability Legislation and RTOs/ISOs

Last year the Senate adopted the NERC legislation as S. 2071, but the bill died in the House. Senator Smith reintroduced that legislation this year (S. 172). In addition, the NERC legislation (including provisions addressing coordination with regional transmission organizations (RTOs)) has been included as part of both Senator Bingaman's bill (S. 597) and Senator Murkowski's bill (S. 389). Similar language has been introduced in the House of Representatives by Mr. Wynn (H.R. 312).

The pending legislation addresses the role of both independent system operators (ISOs) and RTOs, as well as the role of state commissions. Independent system operators and regional transmission organizations fall within the defined term "system operator" in the pending legislation. As system operators, both ISOs and RTOs would be obligated to comply with established reliability rules, just as other kinds of system operators and other users of the bulk power system would be obligated to comply with those rules. In Order No. 2000, FERC stated that RTOs must perform their short-term reliability functions consistent with established NERC (or its successor) reliability standards and notify the Commission immediately if implementation of these or any other externally established reliability standards will prevent it from meeting its obligation to provide reliable, non-discriminatory transmission service.

The issue of coordinating the reliability-related activities of the new electric reliability organization envisioned by this legislation and RTOs arose during last year's legislative efforts. NERC worked with FERC, PJM, the California Independent System Operator and several others to address that issue. We agreed to specific language to address that issue, and that language has been incorporated in both Senator Bingaman's bill (S. 597) and Senator Murkowski's bill (S. 389). It is also included in the bill pending in the House of Representatives (H.R. 312).

The NERC reliability legislation also addresses the role of state commissions. The legislation gives the new electric reliability organization authority to set and enforce rules for only the bulk power system. Eighty per cent of power outages take place on local distribution systems, and those remain wholly under state jurisdiction. Language has been included to make clear that issues concerning the adequacy and safety of electric facilities and services, matters traditionally within the purview of state commissions, remain with the state commissions. The new reliability legislation specifically would not preempt actions by a state commission with respect to the safety, adequacy, and reliability of electric service within that state, unless the state's actions were inconsistent with reliability rules adopted by the new reliability organization. Those provisions were worked out with representatives of the states. Both Senator Bingaman's and Senator Murkowski's bills contain that language.

NERC strongly urges you to adopt legislation containing these reliability provisions in this session of Congress. That will enable us to develop an organization and infrastructure to enforce the reliability rules and keep the grid secure.

Expanding the Transmission System

In addition to making transmission system reliability rules mandatory and enforceable for all operators and users of the bulk power system, we also need to remove the impediments to expansion of the transmission grid. NERC submitted extensive testimony on that subject to the Senate Committee on Energy and Natural Resources on May 15, 2001. I refer you to that testimony. Briefly, I would group the impediments to expanding the transmission grid into three areas.

The first has to do with the certification and siting of new transmission facilities. Projects that would strengthen the grid are today being delayed due to an inability to obtain certification and rights of way. Other projects are not even attempted, as potential developers decide not to undertake the effort.

A second major impediment to expanding the transmission grid has to do with economics. The cost of transmission is a relatively small portion (6 to 8 %) of the overall cost of delivered electricity. A robust transmission system would pay large dividends by increasing our supply options and allowing us to move large blocks of power from where it is available to where it is needed. Yet the regulated rates that we allow transmission owners to charge may not compensate for the risk they take on, and are not sufficient to attract the large amounts of capital necessary to upgrade our systems.

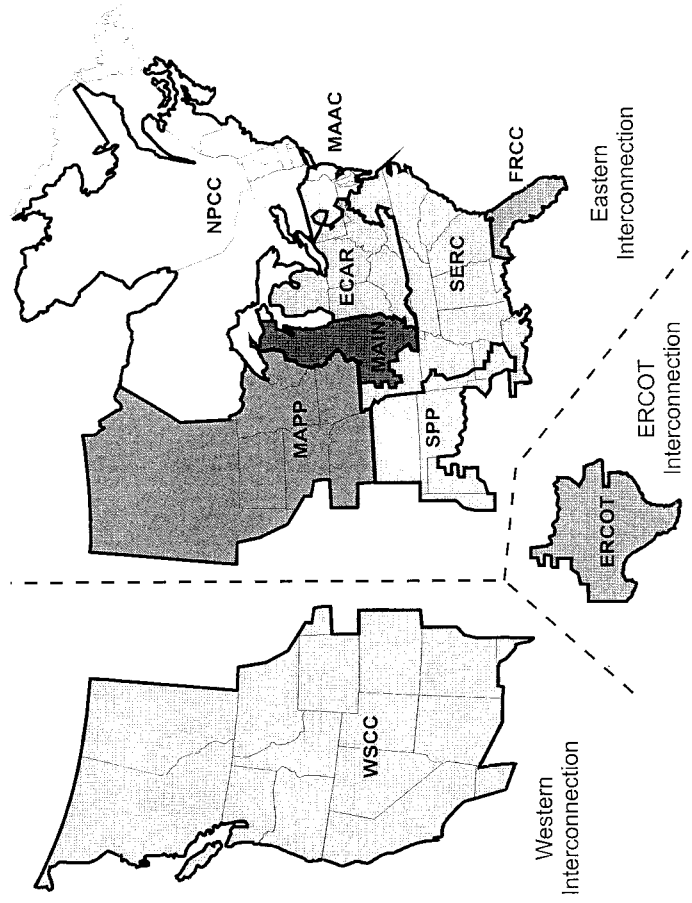
Finally, there is the issue of how many different entities own pieces of the grid and have various responsibilities for it. I earlier spoke about the changes occurring from restructuring as the functions and responsibilities formerly handled by a vertically integrated utility are divided among different entities. Who has the responsibility and authority to build transmission is now less clear. We need to develop mechanisms for assessing what additional facilities the network requires and clearly assigning who has the responsibility and authority to build them.

Conclusion

NERC commends the Committee for attending to the critical issue of assuring the reliability of the interconnected bulk power system as the electric industry undergoes restructuring.

A new electric reliability oversight system is needed now. The continued reliability of North America's high-voltage electricity grids, and the security of the customers whose electricity supplies depend on them, are at stake. An industry self-regulatory system is superior to a government system for setting and enforcing compliance with grid reliability rules. Pending legislation would allow for the timely creation and FERC oversight of a viable self-regulatory reliability organization. The reliability of North America's interconnected transmission grid need not be compromised by changes taking place in the industry, provided reliability legislation is enacted now.

Interconnections and NERC Regions





NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

June 18, 2001

The Honorable Jeff Bingaman
Senate Energy & Natural Resources Committee
703 Hart Senate Office Building
Washington, D.C. 20510

RE: HIGH-VOLTAGE ELECTRIC SYSTEM RELIABILITY LEGISLATION

Dear Senator Bingaman:

The North American Electric Reliability Council (NERC) and a broad-based list of electric industry and state organizations are writing to urge your support for prompt Senate passage of federal legislation in this session of Congress to promote and ensure the continued reliability of high-voltage electric transmission systems in the United States and throughout North America. This international transmission grid – the backbone of our electricity infrastructure – is critical to public health, safety, welfare, and national security, while enabling robust competition in electricity markets.

In the Senate, legislative language to make the reliability rules mandatory and enforceable has been included as part of both S. 389 and S. 597. In the House the equivalent language has been introduced on a stand-alone basis (H.R. 312). The President's National Energy Policy has endorsed legislation providing for enforcement of reliability rules by a self-regulatory organization subject to oversight by the Federal Energy Regulatory Commission (FERC). It is critically important for Congress to act on reliability legislation as soon as possible. It will take many months after legislation is enacted for FERC to adopt implementing rules and designate the new electric reliability organization that the legislation provides for. In the meantime, consumers are exposed to increased risk of failure of the transmission grid as more and more demands are placed upon it.

For three decades, NERC and its member Regional Reliability Councils have worked cooperatively and voluntarily to set reliability standards for high voltage transmission systems so that customers could enjoy reliable electric service. As electricity markets become increasingly competitive, this voluntary arrangement will no longer suffice and needs to be transformed into a mandatory system to assure a continued reliable supply of electricity to America's homes and businesses.

The essence of the various pending bills is the creation of an independent, industry self-regulatory reliability organization to establish and enforce compliance with mandatory rules for the reliable operation of the high voltage electric transmission system. Such rules must be fairly developed and fairly applied to all operators and users, under the oversight within the United States of FERC. The proposal follows the model of securities industry self-regulatory organizations (the stock exchanges and NASD) and enjoys broad, bipartisan support.

These various bills contain language to address the concerns raised during the past two years with regard to the appropriate role for state commissions and for regional transmission organizations. NERC and the other supporting organizations urge you to act on reliability legislation. Having Congress enact this legislation now is an important step to ensure the continued reliability of the nation's high-voltage electricity system, and one that should not wait.

Thank you for your support.

Sincerely,



Michehl R. Gent
President and CEO
North American Electric Reliability Council

ATTACHMENT 1

Organizations that join NERC in urging prompt passage of Federal electric reliability legislation:

North American Electric Reliability Council (NERC)
American Public Power Association (APPA)
Canadian Electricity Association (CEA)
Edison Electric Institute (EEI)
IEEE-USA
Large Public Power Council (LPPC)
National Association of Regulatory Utility Commissioners (NARUC)
National Association of State Energy Officials (NASEO)
National Association of State Utility Consumer Advocates (NASUCA)
National Electrical Manufacturers Association (NEMA)
National Rural Electric Cooperative Association (NRECA)
Northwest Regional Transmission Association (NRTA)
Transmission Access Policy Study Group (TAPS)
Western Interconnection Coordination Forum (WICF)

COALITION MEMBER DESCRIPTIONS**NERC**

The North American Electric Reliability Council (NERC) is a not-for-profit industry group formed after the Northeast blackout in 1965 to promote the reliability of the bulk electric systems that serve North America. It works with all segments of the electric industry as well as customers to "keep the lights on" by developing and encouraging compliance with rules for the reliable operation of these systems. It comprises ten Regional Reliability Councils that account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

APPA

The American Public Power Association (APPA) is the service organization for the nation's more than 2000 community-owned, locally controlled, not-for-profit electric utilities.

CEA

The Canadian Electricity Association (CEA) is the trade association for most of the investor-owned and crown-owned electric utilities in Canada. CEA's members account for about 95 percent of Canada's installed generating capacity, all of the high voltage transmission, and most of the nation's distribution systems.

EEl

The Edison Electric Institute (EEl) is the association of U.S. shareholder-owned electric companies, international affiliates and industry associates worldwide. Our U.S. members serve over 90 percent of all customers served by the shareholder-owned segment of the industry. They generate approximately three-quarters of all the electricity generated by electric companies in the country and service about 70 percent of all ultimate customers in the nation. EEl's mission focuses on advocating public policy; expanding market opportunities; and providing strategic business information.

IEEE-USA

IEEE-USA, an organizational unit of the Institute of Electrical and Electronics Engineers, Inc., promotes the career and technology policy interests of the more than 230,000 electrical, electronics, and computer engineers who are U.S. members of the IEEE. IEEE-USA's mission is to recommend policies and implement programs specifically intended to serve and benefit the members, the profession, and the public in the United States in appropriate professional areas of economic, ethical, legislative, social and technology policy concern.

LPPC

The Large Public Power Council (LPPC) is an organization composed of the nation's 21 largest locally owned and controlled public power systems.

NARUC

The National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization founded in 1889. Its members include the governmental agencies that are engaged in the regulation of utilities and carriers in the fifty States, the District of Columbia,

Puerto Rico and the Virgin Islands. NARUC's member agencies regulate the activities of telecommunications, energy, and water utilities.

NASEO

The National Association of State Energy Officials (NASEO) is a nonprofit corporation whose members include energy officials from 54 state and territory energy offices. NASEO members develop and implement energy programs and policies and are generally governors' energy advisors.

NASUCA

The National Association of State Utility Consumer Advocates (NASUCA) is an association of 42 consumer advocate offices in 39 states and the District of Columbia and includes members designated by the laws of their respective states to represent the interests of utility consumers before state and federal regulators and the courts.

NEMA

The National Electrical Manufacturers Association (NEMA), celebrating its 75th anniversary, is the leading trade association in the United States representing the interests of electroindustry manufacturers. Founded in 1926 and headquartered near Washington, D.C., its 450 member companies manufacture products used in the generation, transmission and distribution, control, and end-use of electricity. Annual shipments of these products total \$100 billion.

NRECA

NRECA is the not-for-profit, national service organization representing 930 rural electric systems that provide electric service to 34 million customers in 46 states in 2500 of the nation's 3128 counties. Of the 930 systems, 60 are generation and transmission cooperatives that are owned by and serve 695 of 870 distribution systems.

NRTA

The Northwest Regional Transmission Association (NRTA) is a voluntary organization of transmission providers, U.S. and Canadian transmission users and Northwest regulatory commissions. It fosters efficient, equitable and reliable use of electric power transmission facilities and assists in resolving disputes related to transmission access. NRTA also provides a forum for coordination of transmission planning and for exchange of information to assist its members in their planning needs.

TAPS

The Transmission Access Policy Study Group (TAPS) is an informal association of transmission dependent utilities in more than twenty-five states, promoting open and non-discriminatory transmission access.

WICF

The Western Interconnection Coordination Forum (WICF) is an ad hoc organization that includes the Western Systems Coordinating Council (WSCC), three Regional Transmission Associations (WRTA, SWRTA, NRTA), the Committee on Regional Electric Power Cooperation (CREPC), Northwest Power Pool, California ISO, and the Rocky Mountain Operating and Planning Group (whose members include utilities, generators, power marketers, state and provincial energy policy advisers and regulators throughout the Western Interconnection). The states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming are included, in whole or in part, in the Western Interconnection.

TESTIMONY OF
 PHILLIP G. HARRIS, PRESIDENT AND CEO,
 PJM INTERCONNECTION, L.L.C.
 HEARING ON THE IMPACT OF
 ELECTRIC INDUSTRY RESTRUCTURING ON SYSTEM RELIABILITY
 UNITED STATES SENATE
 COMMITTEE ON GOVERNMENTAL AFFAIRS
 JUNE 28, 2001

Mr. Chairman, members of the Committee. We are in a critical time in the evolution of the electric industry. In reaction to the California crisis, we can travel down the path of revised regulation of electricity and create vast new command and control structures to ensure the delivery of this vital product to the American consumer. Or we can roll up our sleeves and use the lessons of past missteps and the lessons of success to reaffirm a commitment to finding the best market-based solutions that deliver value to customers. We need solutions that can withstand the test of use, both in good times and bad.

My name is Phillip Harris. I am the President and CEO of PJM Interconnection. We operate the largest centrally dispatched electricity market in the country and the third largest in the world. We manage the reliability of the high voltage electric power grid and operate the world's most successful market for electricity. We serve approximately 8.7% of the U.S. population in a five — soon to be seven — State region stretching from Washington D.C. to the northern border of New Jersey and into Ohio.

We were recently designated by *Business Week* as one of the top 50 businesses in the United States successfully integrating Internet technologies into our business — the only utility to receive such designation. In the PJM region, the restructuring experience has worked. Customers have saved money and enjoy more choices and improved service. Investors are flocking to our region and have announced more than 140 new generating projects, which would add over 40,000 MW of generation to our region, as well as over \$700 million in new and upgraded transmission investment. The attached article from *The Wall Street Journal* outlines in greater detail some of the measures of the PJM success story. Moreover, I would like to reserve the right to supplement this testimony with additional material concerning analyses of the PJM story for the hearing record.

The key to PJM's success has been following our "four-R's". Implementing:

Real Markets operating in
 Real Time supported by
 Real information producing
 Real Results.

Let me focus on each of those.

Real Markets Operating in Real Time---Electricity is not like any other product. It is the only product that is instantaneously produced and consumed and travels at the

speed of light. The North America electric system is comprised of three interconnections — as illustrated in the attached map — that are, in effect, three synchronous motors operating at the speed of light. Thus any solution needs to take into account the physics of the electric grid.

In addition we have a legacy of local practices from the large number of separate electric companies, each of which operated as their own control area. Finally, we have a history of local, State and Federal regulation of this industry. Our challenge is to combine the physics, the local practices, and the legal requirements to devise solutions for reliability “AND” competitive markets.

At PJM, we have devised such “AND” solutions. In the reliability arena we have done so by not artificially dividing up what is reliability versus what are the needs of the market. Rather, on a minute-by-minute basis, 7 days a week, 24 hours a day, our operators balance and harmonize the needs of reliability and the market.

Accordingly, we have the following specific recommendations on how this Committee can work with the FERC to ensure “AND” solutions:

- a. We believe that the FERC should have authority over all of the different market participants when it comes to reliability, including the Federal power marketing agencies, municipals, co-operatives, and investor-owned utilities.
- b. FERC needs to oversee both sides of the equation. If we pigeonhole what is reliability and assign that to one institution and markets to a second institution, we just create a new set of barriers to customer value;
- c. FERC needs to vigorously enforce its Order 2000. If we compromise on the basic structures needed to make markets work, we will have to make costly patches after the fact, as we see in California. This is not the time to “dumb down Order 2000”;
- d. Make sure that the RTOs have planning authority and undertake it in an independent and open manner. Transmission and generation compete with one another. If there is not trust that the planning process is being carried out in a neutral and independent way, we will fail to build the vital infrastructure needed to make the market function well;
- e. FERC’s focus needs to be on developing markets. We have spent a lot of time addressing structural issues. Although they can be important, form follows function. We need to focus on the key ingredients to making the market work;

- f. Ensure that FERC is fully staffed and has the resources to appropriately monitor the markets and regulate in those areas where the market is not properly functioning .
- g. The nation is moving rapidly to networked information through advanced technology. FERC should have these advanced tools and the staff resources to use them in order to identify and be responsive to market dysfunctions in a timely manner. The FERC staff has begun this effort, but more will be needed as markets develop.

Addressing those recommendations, we believe that as part of the “AND” solution it is critical that FERC challenge and hold the newly-created RTOs accountable for balancing reliability and the marketplace. If we create one set of institutions that focus on reliability, while others focus on markets, we run the risk of having our left hand and right hand not working in harmony. Each will be going its separate way, sending confusing signals to the marketplace and to the consumer, and we have just created new seams issues. I believe this is one of the lessons of California, where the power exchange was separate from the ISO. We should not make that same mistake again, but instead recognize that reliability and the needs of the marketplace are intertwined. We need for the two to work together and be subject to comprehensive FERC oversight.

Real Information---At PJM we have proven that if we get critical information out to the marketplace in a timely manner, we can come up with market solutions that protect consumers. We view ourselves as an information company. We post our energy prices and system conditions on our web site and update them every five minutes. Our approach to management of transmission congestion also includes market-based solutions. We have used that information to create markets in the variety of ancillary services that are critical to maintaining reliability.

Moreover, on a longer-term, we are responsible for regional planning. Under the old paradigm, each utility undertook planning on a company-by-company basis and then proceeded with those projects that were deemed to be in its economic interest. There was no requirement for public review or any requirement for an independent planning process. FERC Order 2000, properly enforced, provides that the RTO shall have the authority to engage in regional planning. In PJM we work closely with our State PUCs, as well as our market participants, and just issued a regional plan that provided for the previously mentioned new and upgraded transmission investment. It is critical that FERC ensure that the RTOs it approves:

- a. are truly independent; and
- b. have the authority and expertise to undertake regional planning in a fair and unbiased manner.

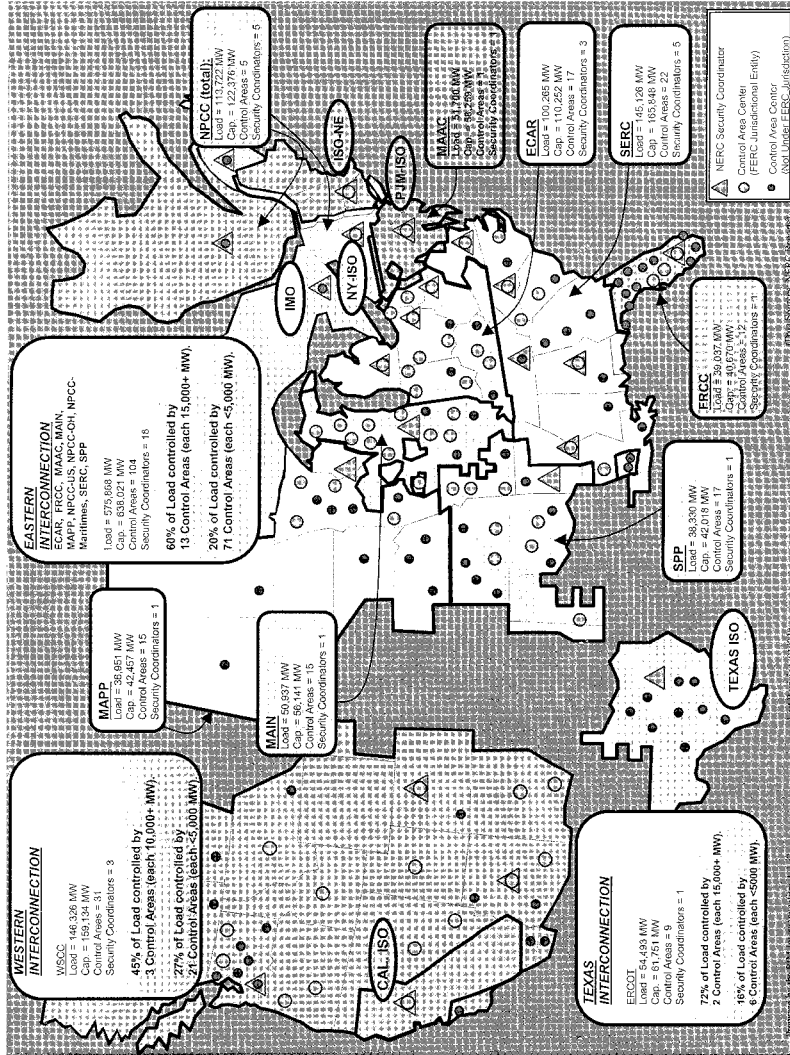
Even with these tools in place, I want to be clear that we do not just throw the reliability of this system and consumers to the vagaries of the marketplace. We have an extremely active market monitoring unit that analyzes transactions over our system to detect any market abuses. And our Board has not hesitated to file at the FERC for

changes to our market rules to nip any such market abuses in the bud. We are grateful to FERC for promptly acting on our requests and feel that we have established an excellent working relationship that provides for quick response by the regulator and by our independent Board to maintain the integrity and fairness of the marketplace, as well as the reliability of the system. But for this to happen, we need to ensure that FERC has the resources to get the job done. It needs to have the tools in place to monitor the markets for this vital commodity. FERC has begun this process through their real-time computer systems and we intend to work closely with them to ensure that they have the key data and resources to get the job done.

Real Results---At the end of the day, the true test is one of use. Billions of dollars in trades have occurred on our system. Although we have a \$1,000 bid cap in place, 99% of the time our prices have cleared below \$100/MWh, and 71% of the time our prices were less than \$30/MWh. System reliability has improved since we became an independent system operator. In 2000, our region experienced extremely high temperatures in May, usually a month when plants are out for maintenance. Even with these shortages in generation our prices only reached \$400/MWh for 4 hours. And the marketplace is supporting our market, as witness the dramatic number of planned generation and transmission projects in our area.

Our message is simple: with the right tools and with institutions such as the FERC with authority to balance the needs of reliability and the marketplace, we can achieve "AND" solutions that promote the interests of all Americans in seeing reasonably priced, reliable electric service for years to come. Providing FERC with the authority to oversee all market participants to ensure reliability, as well as ensuring that our regulatory model comprehensively focuses on the integration of reliability and the marketplace, will enable us to achieve these real results.

Thank you very much. I look forward to your questions.



The Wall Street Journal - May 16, 2001

Commentary

Where Electricity Deregulation Works

By Phillip G. Harris. Mr. Harris is president & CEO of PJM Interconnection, which operates the wholesale electricity market and the power grid for Pennsylvania, New Jersey, Maryland, Delaware, Washington, D.C., and parts of Virginia.

VALLEY FORGE, Pa. -- President Bush is set to announce a free-market approach to energy policy tomorrow. Many critics are skeptical, claiming that deregulation has failed in California.

But take your eyes off California for a moment, and look elsewhere. You'll find that the deregulated electricity market of the mid-Atlantic region -- including parts of Pennsylvania, New Jersey, Delaware, Maryland, the District of Columbia and Virginia -- is working. It has been working since 1997. There are no brownouts. Power prices have declined and consumers are better off. It is the way deregulation is meant to work.

How did deregulation succeed in the mid-Atlantic states, and why hasn't it worked in some other parts of the nation?

In certain respects, the answer is simple. When we deregulated, we created a real regional market that matches supply and demand by ignoring political boundaries. Instead of a one-state market, we created a competitive energy exchange that includes all of the power plants in a multistate region. This grid was built upon the proven reliability of the established power system that preceded it. It was also designed to entice new power producers into the market by allowing participants to have choices -- including long-term contracts of the kind that are banned in California.

The results are real and impressive. Consumers have already saved more than \$3 billion in Pennsylvania by paying prices for electric power that are 4.5% below the national average. The lights are on and there have been no rolling blackouts on the grid in the four years since deregulation began. Moreover, there are 150 new power plant projects planned for the region over the next five years that could increase electrical capacity by more than 70%, keeping supply well in line with demand.

Ours is the biggest electricity market in the world, and the third-largest power grid. This size encourages a high number of market participants. To remain competitive in a large market, power producers and marketers need to keep prices at an acceptable level. If a power producer decided to hike prices above current market value, customers could choose to buy from someone else.

The market's stability is also reinforced by the way it is governed. In the case of PJM, my company, a collaborative model allows more than 200 competing interests to decide

on new market rules and governance by voting on what is best for the market, not for individual business interests.

This task is carried out by the two-tier governance model of a totally independent board of managers and a members' committee made up of the market stakeholders -- power marketers, regulators, transmission owners, generation owners, and large business consumers. The members of the board are screened for more than 200 different stocks to ensure that they have no financial stake in any of the decisions they would be called to make for the market. The members' committee proposes and votes on changes to market rules. Their collaborative efforts have made more than 100 changes to the rules since 1997.

One of the driving forces in the move to deregulation was our customers' desire to have the freedom to choose who supplies their power. With a market involving more than 200 participants and a variety of electricity and contract-purchase options, the mid-Atlantic region has its share of choice. But we don't stop there. Trading electricity into, and out of, the region is also encouraged. On any given day, the power comes from as far away as Oklahoma and Florida.

To make choices, you need information. The wholesale electricity market is unlike any other. The transaction from production to consumption happens at the speed of light. Putting real market information in the hands of all decision-makers instantaneously is crucial to keeping an even playing field for buyers, sellers and consumers. Keeping up the pace in such an environment requires effective use of technology to provide real-time information.

A suite of Internet tools has been developed to operate many different markets and to provide up-to-the-minute (sometimes seconds) pricing information, so that informed business decisions can be made. If the price is too high, the participant can choose to shift their operations or buy power elsewhere. The choice is theirs, because the information is there.

The country must now choose whether to continue deregulating electricity markets. The information to make that decision is available: We offer a model that is working.

**Testimony of
Kevin A. Kelly
Federal Energy Regulatory Commission
Before the Committee on Governmental Affairs
United States Senate
June 28, 2001**

Mr. Chairman and Members of the Committee:

Good morning. My name is Kevin A. Kelly and I am the Director of the Division of Policy Innovation and Communication within the Federal Energy Regulatory Commission's Office of Markets, Tariffs and Rates. I am appearing here today as a Commission staff witness, and I do not speak for the Commission itself or for any individual Commissioner.

Thank you for the opportunity to speak today on how the reliability of electric service is being affected by the industry's restructuring, and the Commission's role in ensuring the reliability of service. Restructuring is bringing many new participants into the electric business, changing the roles of traditional participants, increasing the number of wholesale power transactions, as well as increasing the distances over which power transactions take place. These changes place new stresses on the transmission system and raise questions about whether today's industry, as it is currently structured, will provide the additional generation and transmission investment needed for reliable electric service for our nation.

The Commission's fundamental role in the electric utility industry is to regulate public utilities with respect to the sale of electric energy at wholesale in interstate

commerce and the transmission of electric energy in interstate commerce. The Commission's role, thus, is to serve essentially as an economic regulator. With certain exceptions, the Commission does not regulate the service provided by municipal utilities, most electric power cooperatives, federal power marketing administrations and the Tennessee Valley Authority.

In layman's terms, "electric reliability" simply is a measure of how often a customer's electric power supply is unexpectedly interrupted. For most customers, reliability means that the lights come on when they flip a switch. For some customers today, however, reliability may also refer to whether there are power interruptions for a tiny fraction of a second (which most of us would not notice but a computer would), whether the electric current maintains a frequency of 60 cycles per second so the electric clocks keep good time, or whether the voltage remains at the right level so that voltage-sensitive equipment operates properly.

Since the electric power industry began, reliability has been primarily the responsibility of the customer's local utility. To ensure reliability, the utility must have access to three things: generators to create electric power; high voltage transmission facilities to move that power economically over long distances; and lower voltage distribution lines to deliver the power to customers in a local area. Power systems engineers distinguish two facets of reliability: adequacy, which means having enough of these facilities to avoid interruptions; and security, which means operating them within safe limits and in a coordinated manner to avoid interruptions.

Almost all the power interruptions of the typical customer are due to distribution system outages. These occur when, for example, a tree falls on a neighborhood power line or a digger cuts an underground electric cable. Although common, distribution outages affect only a small area. Transmission problems, on the other hand, can affect a large area, covering many states in rare cases. These may be caused by such problems as a lightning strike or an ice storm disabling one or more transmission lines. Generation adequacy has been, until recently, the least frequent cause of reliability problems in the United States.

Utilities have been accountable to state utility commissions or other local regulators for reliable service. A typical state will keep statistics on distribution system interruptions in various neighborhoods, inspect the transmission system rights-of-way for unsafe tree growth near power lines, and set requirements for "reserve" generation capability to cover unexpected demand growth and unexpected outages of power plants. State or local regulators also exercise the authority of eminent domain and have siting authority for new generation, transmission, and distribution facilities needed to maintain an adequate power system.

A major blackout affecting several states in the Northeast in 1965 was caused by poor and uncoordinated transmission system operating practices. President Johnson directed our agency's predecessor, the Federal Power Commission (FPC), to investigate and report on this power failure. The FPC issued its report in December 1965, in which it stated:

When the Federal Power Act was passed in 1935, no specific provision was made for jurisdiction over reliability of service for bulk power supply from interstate grids, the focus of the Act being rather on accounting and rate regulation. Presumably the reason was that service reliability was regarded as a problem for the states. Insofar as service by distribution systems is concerned this is still valid, but the enormous development of interstate power networks in the last thirty years requires a reevaluation of the governmental responsibility for continuity of the service supplied by them, since it is impossible for a single state effectively to regulate the service from an interstate pool or grid.

Northeast Power Failure. A Report to the President by the Federal Power Commission,
p. 45 (Dec. 6, 1965).

Also as a response to this power failure, the industry formed the North American Electric Reliability Council (NERC). NERC is a voluntary membership organization that sets rules primarily for transmission security in the lower 48 states, almost all of southern Canada, and the northern part of the Baja peninsula in Mexico. More detailed rules are prescribed by ten regional reliability councils, which are affiliated with NERC.

Recent changes in the electric power business tend to leave more matters affecting reliability outside the exclusive control of the local utility. Electricity trading patterns are becoming increasingly regional and reliability is now more likely to be affected by the actions of parties that may be several states away. This means that it is more important than ever to have clear reliability rules that are observed by everyone. Unfortunately, NERC lacks authority to enforce its rules. Because changes in the industry increased both the incentive for, and frequency of, NERC rule violations, NERC now advocates

making transmission reliability oversight a government function so that interstate and international reliability rules can be enforced uniformly. (NERC's proposal would not address generation and distribution issues.)

The Commission has no statutory authority to promulgate and enforce a set of mandatory reliability standards. The Federal Power Act contains only limited authorities on reliability. Under FPA section 202(c), for example, whenever the Department of Energy determines that an "emergency exists by reason of a sudden increase in the demand for electric energy, or a shortage of electric energy or of facilities for the generation or transmission of electric energy . . . or other causes," it has authority to order "temporary connections of facilities and such generation, delivery, interchange or transmission of electric energy as in its judgment will best meet the emergency and serve the public interest." The Department of Energy exercised this authority several months ago in ordering emergency sales of power to California.

Under sections 205 and 206, the Commission must ensure that all rates, terms and conditions of jurisdictional service (including "practices" affecting such services) are just, reasonable and not unduly discriminatory or preferential. These sections generally have been construed as governing the commercial aspects of service, instead of the reliability aspects. However, there is no bright line between "commercial practices" and "reliability practices."

Indeed, the Commission has acknowledged that reliability issues may sometimes fall within its ratemaking jurisdiction. In Green Mountain Power Corp., 59 FERC ¶

61,213 (1992), the utility filed new transmission rates, and customers intervened and asserted that they were subject to rolling blackouts and voltage reductions. The customers asked the Commission to condition its acceptance of the transmission rates on Green Mountain's commitment to upgrade or construct new facilities. The Commission ruled that the reliability issues could be fully addressed in the section 205 proceeding as an issue of whether rates should be adjusted to reflect the quality of service. The Commission said, "reliability concerns of this type, implicating the firmness of contractually agreed-upon service and the possibility of undue discrimination, "bear upon the reasonableness of rates under a contract which is subject to the Commission's jurisdiction." (Quoting North Carolina Electric Membership Corp. v. Virginia Electric and Power Co., 52 FERC ¶ 61,298 (1990)).

Similarly, in New York State Reliability Council, 90 FERC ¶ 61,313 (2000), the NYSRC submitted a filing to reduce a generation adequacy measure, called the installed capacity requirement, for the New York Control Area from 22 percent to 18 percent. Commission approval of such a reliability standard was required by a previously-filed agreement between the NYSRC and the New York ISO. The Commission accepted the reduced installed capacity requirement, stating that certain reliability provisions may affect the rates, terms and conditions of jurisdictional transmission and power sales services within the Commission's exclusive jurisdiction. On the merits of the change, however, the Commission found only that the change "does not appear to have an adverse effect on matters within our exclusive jurisdiction."

Finally, in Village of Freeport v. Consolidated Edison Co. of New York, Inc., 87 FERC ¶ 61,301 (1999), the Commission set for hearing a complaint alleging numerous outages of firm transmission service. In doing so, the Commission defined the issue as whether the utility had "followed good utility practice in providing the firm service required by the [Commission's] pro forma tariff and provided not unduly discriminatory electric transmission service to Freeport, and if it has not, what remedies are appropriate."

In short, FPA sections 205 and 206 require the Commission to consider reliability issues only in limited circumstances. In setting rates within the zone of reasonableness, the Commission may consider the adequacy of service. Even in those cases, however, the Commission is not deciding whether a particular reliability standard is acceptable per se but whether the rates, terms and conditions of jurisdictional service associated with that standard are just, reasonable and not unduly discriminatory or preferential from a commercial perspective.

The remaining authorities granted to the Commission in the area of reliability are very limited. For example, under FPA section 207, if the Commission finds, upon complaint by a State commission, that "any interstate service of any public utility is inadequate or insufficient, the Commission shall determine the proper, adequate or sufficient service to be furnished," and fix the same by order, rule or regulation. The Commission cannot exercise this authority except upon complaint by a State commission.

The Public Utility Regulatory Policies Act of 1978 also provides limited authority on reliability. For example, under PURPA section 205, the Commission can exempt

electric utilities from state laws that prevent voluntary coordination of facilities and resources. Under PURPA section 209(b), the Department of Energy, in consultation with the Commission, may ask the reliability councils or other persons (including federal agencies) to examine and report on reliability issues. Under PURPA section 209(c), the Department of Energy, in consultation with the Commission, and after public comment, may recommend reliability standards to the electric utility industry, including standards with respect to equipment, operating procedures and training of personnel.

The paucity of federal authority to address reliability issues, and increasing concern about the shortcomings of the traditional voluntary approach to reliability issues, have led some in the industry to seek other approaches. For example, one approach that has been pursued is enforcing reliability standards through contracts. Public utilities may voluntarily include reliability-related provisions in contracts or tariffs filed with the Commission because they affect or relate to the rates, terms and conditions of jurisdictional service. If reliability provisions in Commission-jurisdictional contracts are accepted and on file with the Commission, the Commission can enforce the reliability-related provisions against public utility parties to the contracts. Enforcement of such provisions against non-public utility parties (*e.g.*, municipal utilities, most electric power cooperatives and federal power marketing administrations) may have to be pursued in the appropriate state court or other forum by the public utility parties to the contracts.

A system of such contractual arrangements has been established by utilities in the Western Systems Coordinating Council, the regional reliability council for the Western

United States. When the contracts were filed, the Commission offered no opinion on the technical adequacy of the WSCC standards, but did approve them as consistent with the "just and reasonable" standard of the Federal Power Act. Specifically, the Commission stated that:

we do not intend to assume the role the regional reliability groups have traditionally performed in developing reliability criteria. Instead, we will consider such criteria only to the extent needed to fulfill our traditional role of ensuring that rates, terms and conditions of jurisdictional service, as distinct from reliability criteria, satisfy FPA requirements.

Western Systems Coordinating Council, 87 FERC ¶ 61,060 at 61,234 (1999) (citing Central and South West Services, Inc., Opinion No. 332, 48 FERC ¶ 61,197 at 61,733 n.24, order on reh'g, Opinion No. 332-A, 49 FERC ¶ 61,118 (1989)).

The effectiveness of the WSCC arrangement and the Commission's ability to enforce it have not been fully tested. But, a voluntary contractual regime is not the simplest or most effective means of establishing and adequately enforcing reliability standards. It depends solely on the willingness of public utilities to make voluntary filings, and even then, it may not capture all electric facilities in a region because many of those facilities may be controlled by utilities that are not subject to the Commission's jurisdiction under sections 205 and 206 of the FPA. Reliability is at risk to the extent that not all market participants are covered by the same requirements.

Another approach to ensuring reliability is enacting federal legislation. This year, on May 17, the Administration released its National Energy Policy Report. The Report

recommends that the President direct the Secretary of Energy to work with the Commission to improve the reliability of the interstate transmission system and to develop legislation providing for enforcement by a self-regulatory organization subject to the Commission's oversight.

I believe a legislative approach is preferable to the contractual approach discussed above. I take no position, however, on whether the legislation should be based on NERC's proposal or any other version of reliability legislation.

The Commission's potential role in overseeing the establishment of a bulk power reliability organization and standards would not infringe or compromise the ability of states to ensure the reliability of electric distribution systems on behalf of retail customers. Reliability standards are now, and would continue to be, developed by market participants through regional and national self-regulating organizations. Local and regional protocols should continue to be developed and agreed to at the regional level. Reliability protocols that states rely on should be coordinated with regional organizations that represent other parts of the interconnected grid. The primary effect of legislation on reliability would be to make the rules enforceable. Any such legislation should contain avenues for appeal or review of rules by parties, including states, who believe that the rules need to be amended or changed to better protect the reliability of their service or who feel that the rules are unjust, unreasonable or unduly discriminatory.

Congress should understand, however, that mandatory reliability rules alone are not enough to ensure the reliability of the grid. For example, the Commission has

encouraged the formation of regional transmission organizations (RTOs), to overcome the inefficiencies of the highly balkanized way in which the interstate transmission grid is now operated. In adopting its Order No. 2000 rule on RTOs, the Commission set out at length the need for an RTO to ensure reliability in each region. The needs include coordinated operation and maintenance of interconnected transmission systems, improved determination of transmission system throughput capability, and unified regional planning of necessary grid additions. In Order No. 2000, the Commission stated in particular that an RTO must have the authority to ensure the short-term reliability of the regional grid and must be responsible for planning, and for directing or arranging, necessary transmission expansions and upgrades that will enable it to provide efficient and reliable transmission service.

We also must have adequate generating resources. For example, a current issue is whether those who sell power to retail customers must have a specified percentage of generation reserves. Also, as the Commission required in its Order No. 888, all public utility transmission providers must offer ancillary services to their transmission customers. These include, *e.g.*, spinning and non-spinning generation reserves.

We also need to find ways to encourage and facilitate the construction of new transmission facilities. Market rules must elicit sufficient investment in new transmission facilities. For example, to provide transmission owners with an incentive to meet the needs of transmission users, the Commission could adopt performance-based rates

reflecting the reliability of a transmission owner's service. The Commission already has authority to adopt such rate mechanisms under section 205 of the Federal Power Act.

In closing, the restructuring of the electric power industry makes necessary a careful consideration of the tools for ensuring the reliability of electric service. The Commission has only limited authority to address reliability, and the need for new approaches is clear. Federal transmission reliability legislation is one such approach, but alone is not sufficient. The nation must also develop regional transmission organizations for reliable grid operation and must develop its generation and transmission infrastructure.

**TESTIMONY BEFORE THE UNITED STATES SENATE
COMMITTEE ON GOVERNMENTAL AFFAIRS**

IRWIN A. POPOWSKY, CONSUMER ADVOCATE OF PENNSYLVANIA

My name is Irwin Popowsky. I have served as the Consumer Advocate of Pennsylvania since 1990. I am also the Past President and former Chairman of the Electric Committee of the National Association of State Utility Consumer Advocates (NASUCA). From 1997 to 2001, I served as the first (and last) representative of small utility consumers on the Board of Trustees of the North American Electric Reliability Council (NERC). Since NERC moved to a wholly independent board structure earlier this year, I have served on the newly-established NERC Stakeholders Committee. I am testifying today on behalf of NASUCA.

NASUCA is an organization comprised of offices from 40 states and the District of Columbia, charged by their respective state laws to represent utility consumers before federal and state utility regulatory commissions, before other federal and state agencies and before federal and state courts. Each NASUCA member has extensive experience with regulatory policies governing the electric utility industry and has actively participated in the recent debates concerning restructuring of the industry and proposed federal electricity reliability legislation. NASUCA members' primary interest is the protection of residential and other small utility consumers.

In your letter of invitation to speak here today, you asked NASUCA to address “the challenges to electric system reliability resulting from the restructuring of the electric industry and its increasing reliance on competitive markets.” In my opinion, there is no more important issue facing the electric industry and its consumers today. There remains tremendous disagreement across the Nation regarding the relative benefits and costs of electric restructuring. But there is little disagreement, at least in my view, that if the road to restructuring leads us down the path of severely deteriorated reliability then we will have accomplished little as a Nation and will indeed have set ourselves back both economically and in terms of basic human welfare.

Today, I would like to discuss the role of the states, the NERC, the Federal Energy Regulatory Commission (FERC) and the Regional Transmission Organizations (RTO's) in ensuring that the American public will continue to receive the reliable electric service that they have grown to expect and which I think they deserve.

In my view, each state must continue to play an important role in ensuring reliability for its consumers. In practice, the largest number of day-to-day outages and reliability problems that affect retail consumers occur on the local distribution system, which has been and remains under state jurisdiction. States have long experience addressing these issues. They are already dedicating resources to this aspect of reliability. Therefore, federal involvement here would be duplicative and less effective than the current state efforts. Indeed, each piece of legislation addressing reliability that is now before Congress contains language which makes it clear that

nothing in the legislation "shall be construed to preempt any authority of any State to take action to ensure the safety, adequacy, and reliability of electric service within that State" as long as such action is not inconsistent with any organizational standards established under the Act. It is essential that any actions taken either by FERC, NERC, or Congress continue to recognize the necessary and valuable role played by the states in this issue.

Nevertheless, it is obvious that electric reliability problems can affect more than one state. Indeed, NERC itself was formed in response to the blackout of 1965 that cascaded across the Northeast with no respect for state boundaries. In my opinion, NERC and its member Regional Reliability Councils have done an outstanding job in developing and helping to implement standards and tools to operate an extremely reliable electric network across the United States and Canada. NERC, however, is a voluntary organization and traditionally it has had no ability to enforce its rules through anything more than peer pressure. To its credit, I believe that NERC has done almost everything that it can do, first to open its doors to organizations like NASUCA that are outside of the traditional utility industry, and then to establish a fully independent board of trustees composed of distinguished individuals who do not have a stake in any particular industry segment. NERC and some of its regional councils have also attempted to develop contractual enforcement mechanisms to put more force behind their rules and standards.

But NASUCA agrees with NERC that more is needed, and we fully support the legislation that has been proposed in both the United States Senate and House of Representatives that

would establish a self-regulating industry organization that would continue to develop reliability standards, but whose standards would be fully enforceable and ultimately subject to the review of the FERC. I believe that this proposal is not only a reasonable allocation of responsibility between NERC and FERC, but that it is essential in a world of increased competition, particularly at the wholesale bulk power level. The players in this game can no longer also serve as the referees, and the referees must be able to do more than just issue warnings to the players who violate the rules. We need legislation that will establish a self-regulating organization that is focused on reliability and has the expertise to set standards and rules that are enforceable with real penalties and that have the ultimate backing of federal law through review by the FERC.

What else can FERC do? Now that FERC is back at its full five-member complement, I hope that it will turn its attention as soon as possible to completing the task of establishing a complete set of regional transmission organizations (RTO's) across the United States. These organizations will play a vital role in the operation and planning of the electric network in a reliable and economical fashion. If it were up to me, many of these organizations would look a lot like the PJM Independent System Operator (PJM ISO), which serves both my home in Harrisburg and the people here in the Nation's Capital, and which I think has operated the most successful regional market in the United States. In particular, I would urge the FERC to look at the model of the PJM independent board as an important aspect of developing an effective, reliable system which is not dominated by any individual company or industry segment. But in any case, I believe that the new RTO's must coordinate their activities closely with their respective regional reliability organizations and with any new national reliability organization that

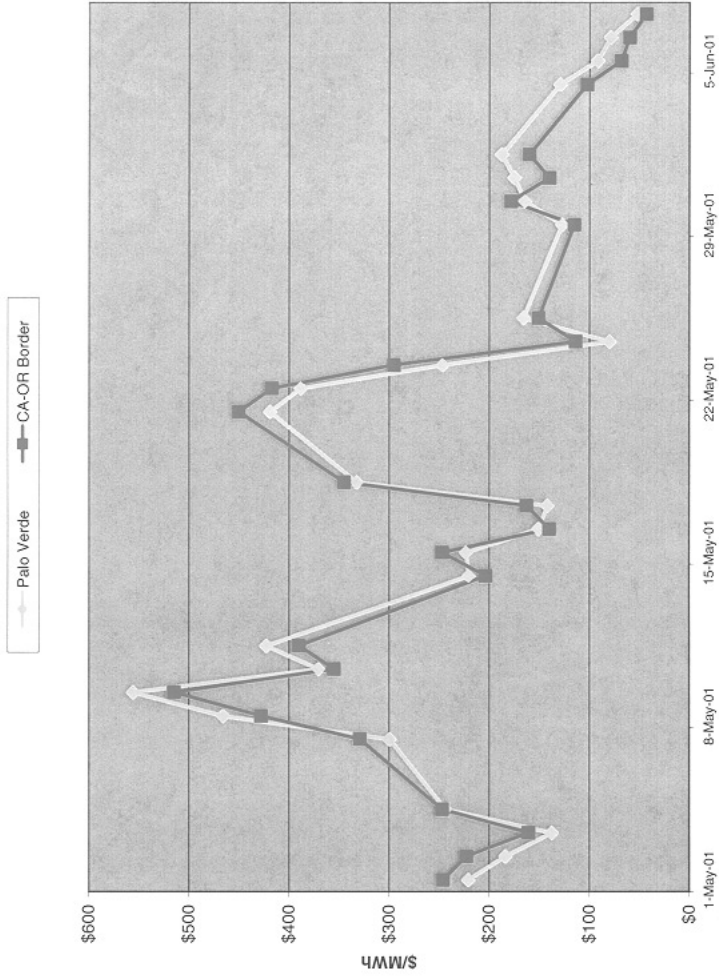
may arise from current legislation. Ultimately, every reliability standard will have effects on the economics of many transactions, and any economic transaction could have an effect on reliability. RTO's and reliability organizations must work together on wholesale bulk power issues, but ultimately they must both answer to a single entity, which I believe for interstate purposes must be FERC.

I would like to close with a personal observation about the recent electric restructuring experiences in California and my own experience in Pennsylvania. Viewing the California situation with the benefit of hindsight from 3,000 miles away, I would have to say that even if wholesale prices had not spiked to absurd levels and even if major utilities had not been thrown into financial disarray, the reliability impacts alone of the recent and current situation in California are totally unacceptable. I honestly never thought I'd see the day when such a large segment of the American public could not be confident that their lights would stay on from one day to the next. A few years ago, some people questioned whether there would be adequate generation supplies at reasonable prices in a restructured electric industry, but they were assured that "the market would provide." Well, the market hasn't provided in California. The question our Nation must face is whether the failure of the California market was a result of a "Perfect Storm" of events, in which everything that could go wrong (including the weather) did go wrong; or whether California is the canary in the mineshaft, giving the rest of the Nation a warning that we should turn back from this path as soon as possible.

In contrast, when I look in Pennsylvania at the current PJM market, either as a result of good fortune (including good weather) or skill, I generally see reliable service, supply keeping up with demand, new plants under construction, transmission planning being conducted on a regional basis, the beginning of the development of demand side response programs, and prices that at least most hours of the year are within the range of what one would expect to see in a competitive market. The PJM market still has several flaws and is far from perfect, particularly in the PJM capacity market, but at least the Staff and Independent Board of PJM, as well as many PJM members, recognize these flaws and are taking steps to try to remedy them.

I am hopeful that our experience in PJM to date will turn out to be closer to the rule and that the recent California experience will prove to be the exception, even for those people who are now suffering through it. But I think that we first need to ensure that entities such as the newly reconstituted North American reliability organization, the FERC and the (hopefully) independent RTO's have the tools to create enforceable reliability rules and market structures where the benefits of competition can be secured for all Americans in a reliable and economic manner.

California Day-Ahead Power Prices

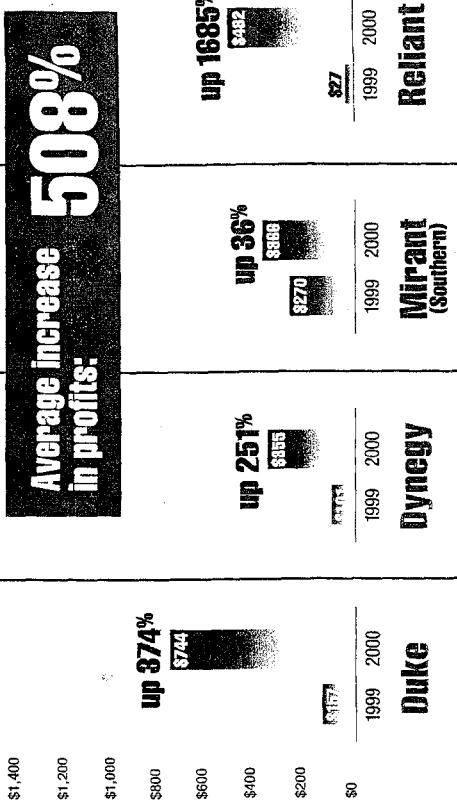


Source: Federal Energy Regulatory Commission



The Big 5 Energy Generators' Profits

(Millions of \$)



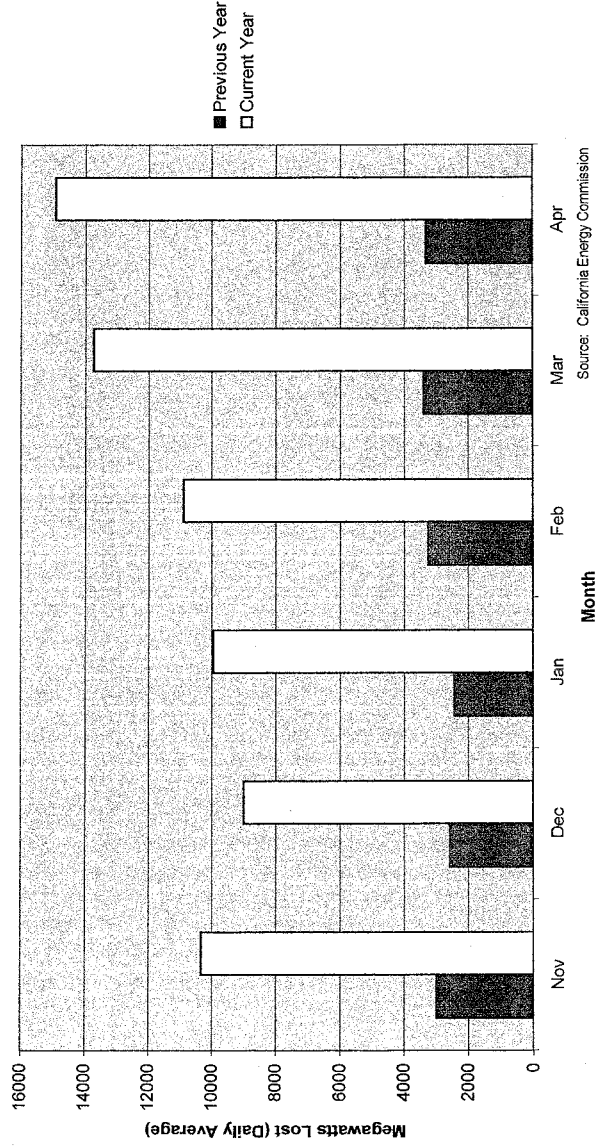
NOTES: Figures shown for Duke reflect energy services earnings before interest and taxes; for Dynegy, marketing and trading, recurring net income; for Mirant, earnings from operations; for Reliant, wholesale energy operating income; and for Williams, energy services profit.

Source: Company Press Releases and Web sites

CLOSED FOR MAINTENANCE?

Average Megawatts Lost Daily

(November 2000 - April 2001 compared to November 1999 - April 2000)



Source: California Energy Commission

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HEADLINE: Short-Circuiting Supply and Demand

BYLINE: Robert J. Samuelson

BODY:

Let us now consider California's electricity mess, which is increasingly a political and public relations phenomenon. California Gov. Gray Davis is doggedly trying to shift blame to President Bush, Republicans and greedy electricity producers. It's easy to admire the audacity of Davis's campaign, though not its candor or courage. If he succeeds, we will all be the losers, because we will draw the wrong lessons from California's plight.

Although details are complex, the root cause of California's electricity problem is simple: Demand outran supply. A booming economy coupled with little power-plant construction led to a scarcity of generating capacity, which was compounded by low levels of water to produce hydroelectric power. Wholesale electricity prices rose dramatically, in part because prices for natural gas -- the fuel used in many of California's plants -- were rising dramatically. None of this was Davis's fault, but he has made a bad situation worse.

He's tried to defy the law of supply and demand. The 1996 "deregulation" of California's electricity industry had forced the major utilities to sell many of their generating plants and buy power on the wholesale market, mainly -- though not exclusively -- from companies that had purchased their old plants. Meanwhile, retail electricity rates were frozen. The idea was that competition among power producers would keep wholesale prices low. When demand overwhelmed supply -- destroying this assumption -- Davis resolutely opposed raising retail electricity rates. The consequences were predictable and disastrous.

First, the state's two largest utilities, Pacific Gas & Electric and Southern California Edison, became insolvent. No business can survive indefinitely if it is forced to buy its product at \$ 1 and resell it at 75 cents. PG&E has declared bankruptcy. Edison also has billions of dollars of unpaid debt and remains out of bankruptcy only at the forbearance of its creditors.

Second, the state had to start buying electricity for the utilities to keep the lights from going out. Early this year the Department of Water Resources (which maintains the aqueducts that move water from Northern to Southern California) became the buyer of last resort. Through late May it had paid almost

The Washington Post, June 13, 2001

\$ 5 billion for electricity. Someday the state hopes to leave the power-buying business. Until then the legislature has authorized the department to issue \$ 13.4 billion in bonds to repay the state's general fund and finance future power purchases.

The point of raising retail rates is not only to cover wholesale power costs but also to dampen demand -- to promote "conservation." People become more energy-conscious. The logic has not impressed Davis, whose rhetoric is self-indulgent and deceptive. Self-indulgent? Here's what he said on a "Frontline" documentary: "Everybody wants me to raise rates and sock it to the ratepayers -- everybody." Well, not everybody. In a Field Poll of Californians, 59 percent described the shortage "as an attempt by energy companies to increase rates." Davis's policy mirrors popular prejudice.

Deceptive? In The Post, Davis wrote that high wholesale electricity rates were crippling the state's economy and "could quickly threaten our national economy." This is a stretch. By Davis's estimate, the state's wholesale electricity costs could hit \$ 50 billion in 2001, up from \$ 27 billion last year. That's a big increase, but California is enormously wealthy. In 1999 its income ("gross state product") was \$ 1,229 trillion. The increase in electricity costs would be less than 2 percent of income. By itself that wouldn't tip the state into recession -- let alone the U.S. economy. The real danger is the legacy of the high-tech investment binge of the late 1990s.

Still, Davis's rhetoric may resonate with the public. Americans love to attribute high prices to corporate cabals. Studies by academics and state agencies claim that power generators have made billions in "excess" profits since mid-2000 and that some may have withheld generating capacity to push up prices. Davis is clamoring for "price caps" to be imposed by the Federal Energy Regulatory Commission and blaming the White House for inaction. (In fact, the commission is providing some price supervision -- greater than during the Clinton administration -- but Davis wants more and says he may sue to get it.)

California's problem doesn't stem mainly from corporate conniving. The studies have two problems: (1) They ignore the fact that electricity demand -- and pressure on wholesale prices -- was artificially high because consumers were insulated from cost increases; and (2) they assume that companies in "competitive" markets must sell at "marginal" cost. (Marginal cost is the cost of producing the last unit of output, ignoring original investment costs. In reality, most companies enter a market only if they think they can recover their full costs.) Many California power producers have recently made huge profits. But under deregulation they need to make big profits in periods of scarce supply to offset low profits or losses during periods of surplus supply. Otherwise they won't invest for the future. Perhaps this volatility argues against deregulation, but even under regulation, supply and demand must be balanced.

Only belatedly is California addressing this bedrock problem. In late March the state decided to raise retail rates, exempting 53 percent of residential customers. ("I reluctantly, after months of holding out, had a partial rate increase," says Davis.) The exemption is too large and, unwisely, concentrates too much of the increase on businesses. Still, the announcement of higher rates and calls for conservation are having an effect. In May electricity use was down 11 percent from forecasts. Meanwhile, the state has approved new plants, and it hopes to raise capacity about 10 percent this summer.

How all this affects blackouts and wholesale prices depends partly on the weather and hydro power. One good omen: Wholesale prices have recently subsided. The real lesson is that the price mechanism is an essential way of restraining demand and encouraging supply. As Davis's behavior demonstrates, it's sometimes unpleasant and unpopular. But he and we condemn it and discard it at our peril.

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June 11, 2001

Senator Fred Thompson
Ranking Member
Senate Committee on Governmental Affairs
340 Dirksen Building
Washington, DC 20510

Dear Senator Thompson:

Price controls are a recipe for disaster. Regulators in California have already proven this point. Their imposition of price controls at the retail level, along with regulations prohibiting energy suppliers from entering into long-term contracts, have created shortages in the form of blackouts and brownouts and forced one major supplier -- Pacific Gas and Power -- into bankruptcy. Now, many involved in the creation of the current chaotic situation would like to see the federal government impose price controls at the wholesale level. This would be a mistake of gigantic proportions.

When caps are imposed and prices pushed below the market level, three things happen: (1) buyers seek to purchase more overriding public conservation efforts, (2) sellers supply less by diverting scarce supplies to more rewarding markets, and (3) new energy transportation and production facilities would continue to decline as the uncertainties created by the regulations drive investors elsewhere. Even when controls are imposed, this scenario is played over and over again, with some appearing not to notice. Somehow, they believe that the next episode of price controls will be different.

The ramifications of price controls imposed by President Nixon provide valuable lessons. Even though the general controls were imposed for a relatively short time, they retarded investment, reduced the mobility of labor, and created other dislocations that hampered the U.S. economy throughout most of the 1970s.

When the general controls were removed in 1973, the price caps in the energy sector were retained. Were it not for their tragic impact on the lives of people, the results would be comical. Regulators and suppliers ended up in court, debating on whether crude oil originated from new wells or old wells because the caps permitted the former to be sold at a higher price.

Even as the shortages multiplied, wells containing sizable amounts of oil were removed from the market because the price caps made it too costly to use modern technology to remove the remaining crude. The controls also led to long gas lines: service stations with limited supplies were open only a couple hours each day. These outcomes were not imposed upon us by either OPEC or greedy oil companies. They were the result of the energy price caps. Thus, they did not occur in Western Europe and other parts of the world where price caps were absent.

Price caps invariably make it appear that the situation is far more severe than is actually the case. The energy price caps illustrate this point. When President Reagan removed the energy price controls in early 1981, the pundits told us that gas prices, which were approximately \$1.25 per gallon at the time, were sure to soar to \$2 or more. Against the chaotic situation of the 1970s, their predictions had a creditable ring. However, as market forces replaced political allocation, the reality was much different. During the first two weeks following the removal of the controls, prices rose by about a dime a gallon, but they soon leveled off and began to fall. Six months after the controls were removed, gasoline prices were well below the prior controlled level. Propelled by market forces, they continued to decline for almost two decades.

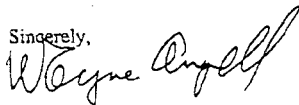
With regard to California's energy market, the conservationists are absolutely right. If blackouts and brownouts are to be avoided in the near term, conservation must be practiced and consumption reduced. Without the appropriate price signals, however, conservation will be weak and ineffective. Millions of people must be encouraged by high prices to switch to lower wattage light bulbs, use fans more and air-conditioning less, purchase more energy-efficient appliances and so on. The California decision to shield consumers by picking up the energy tab ensured that conservation was not going to happen. Price incentives are absolutely essential for the practice of wise conservation.

While supply responses provide the long-term solution, price controls create uncertainty and undermine the incentive to invest, which is essential for the expansion of future supply. It is easy for politicians to promise that the controls will be imposed only temporarily and that reasonable profits would spur investment. Not so. Investors know that when regulators interfere with market signals today, there's no assurance that they will not do so tomorrow. Rather than placing themselves hostage to an uncertain regulatory climate, many potential investors will place their energies elsewhere driving up the cost of transportation and production energy capital in California.

The confidence of the investment community has already been severely damaged by California's regulatory policies. It will take time to repair the damage and regain credibility with investors. The worst thing regulators could do at this time would be to impose still more controls.

However well intended, political manipulation is no substitute for market forces. The Nixon price controls and the gas lines they created provide ample evidence on this point. The sooner regulators make it clear that they are not going to intervene, the sooner market incentives will restore order to the California energy market and the current crisis, like the gas lines of the 1970s, will be behind us.

Sincerely,



**Statement by William C. Dudley
Chief US Economist
Goldman, Sachs and Co.**

US Senate Committee on Governmental Affairs

**Hearings on Economic Issues Associated with
Restructuring of Energy Industries**

June 13, 2001

My name is William Dudley. I am the chief US economist for Goldman, Sachs and Company. It is my pleasure to submit this statement to the US Senate Committee on Governmental Affairs as part of the hearings on *Economic Issues Associated with the Restructuring of Energy Industries*. The views expressed in my statement are my own and do not necessarily reflect the positions or views of Goldman Sachs.

The constituency that favors high electricity prices is a small one. Only the firms that earn extraordinary profits and their shareholders benefit much. As a result, the pressure grows to come up with a solution. In the case of the California energy crisis, the call is to impose price caps on wholesale electricity rates. The idea is that this would prevent the type of large price spikes that have transferred considerably resources to a few power-generating companies.

What's wrong with that? After all, if the caps are set high enough, the firms involved will still make healthy returns on their investment and the cost of electricity to the State of California and, ultimately, its citizens and its businesses will be reduced.

The answer is that the imposition of price caps would have significant negative consequences. First, the imposition of price caps would deter the type of investment in electric power generation and transmission capacity that the State of California seeks to encourage. That is because price caps would reduce the prospective rate of return and raise the risks associated with new investment. The expected return would fall because one tail of the probability distribution of possible outcomes with respect to electricity rates--the tail associated with high price spikes--would be eliminated by the imposition of the caps. But the other tail of the distribution--the one of very low prices--would remain. After all, no one is proposing that, if wholesale electricity rates were to plummet, a corresponding transfer would be made back to the power generating companies. The proposals are for rate caps. They do not also include floors. That reduces the prospective rate of return.

The risk would rise because the imposition of price caps is by its nature arbitrary as to level, timing, and duration. If the caps were imposed, this would increase investor anxiety that the caps could, in the future, be lowered, broadened, or extended in terms of duration. This would increase the level of uncertainty concerning the likely future rate of return on the firms' investment. This risk would be reflected in the cost of capital the firms would incur and in their equity prices.

Lower expected returns, higher risk. This is not the desired outcome if the goal is to encourage greater investment. In fact, the imposition of caps would deter the type of investment that would, over time, act to ameliorate the California energy crisis. Put simply, price caps would work at cross-purposes to the goal of increased electric power generation and transmission capacity that is part of the solution to the California energy crisis.

Second, the caps would deflect attention away from the underlying problems that have

caused wholesale electricity prices to spike: The lack of adequate power generation and transmission capacity and a system of price signals that encourage demand management. The spikes in wholesale electric power prices are a symptom of the underlying problem-- a deeply flawed regulatory regime in which wholesale prices have been decontrolled, but customers do not see a corresponding increase in retail prices. The price caps would do nothing to fix this underlying problem. Moreover, they could do harm by reducing the sense of urgency needed politically to generate a viable, long-term solution.

Finally, even if one were convinced that price caps were not a terrible idea in general, one would still be faced with the difficulty concerning the specifics. When a market system is overridden, then the devil lies in the details. How high is too high? How long is too long? How would the price caps be administered? How would they be phased in? And out?

History has shown quite clearly that price caps distort the allocation of resources by wiping out the price signals determined in the marketplace. Command economies such as the late Soviet Union simply do not work. History has shown that price caps are difficult to administer and tough to remove. Once implemented, price caps create their own entrenched political constituency.

In my view, the solution to the California energy crisis lies not in price caps, but in encouraging the installation of additional electric power generation and transmission capacity. Imposition of price caps works against this.

In my view, the solution to the California energy crisis lies in California businesses and consumers seeing the true economic cost of incremental power generating capacity. In particular, a broad system of peak load pricing should be implemented. This would allow businesses and consumers to see the true costs of incremental power capacity. It would also encourage demand shifting that would reduce the size of the wholesale power rate spikes and the need for incremental power generation and transmission capacity. Moreover, because the demand shifting would be concentrated among those firms and individuals that had the lowest costs to shift demand away from the power peaks, the costs of shifting would be minimized. The goal should be to improve the quality of the pricing signals sent to consumers and businesses, not to subvert those signals.

Sincerely,

William C. Dudley
Chief U.S. Economist
Goldman, Sachs & Company
June 13, 2001

Testimony to the
Senate Governmental Affairs Committee

Hearing, June 13, 2001
on Economic Issues Associated
with Restructuring of Energy

by EIR News Service
prepared by Marcia Baker and John Hoefle
(703-777-9451; marciabaker@larouche.com)

**RE-REGULATE ENERGY;
STOP FINANCIAL AND ECONOMIC COLLAPSE
WITH LAROCHE "GENERAL WELFARE" APPROACH**

If "proof" were needed that restructuring of the U.S. energy sector would lead to crises, then as of today, we have dramatic evidence in California, around the nation, and internationally, that deregulation is a disaster. Therefore, the question posed to Congress is: How fast can we shake off the thinking that allowed this in the first place, and restore the *re-regulation* policies that helped build the U.S. economy in the past?

EIR founding editor Lyndon LaRouche has been leading an international effort to RE-REGULATE the energy sector, and also to restore the standard of health-care-for-all, beginning with the crucial issue of the District of Columbia General Hospital. These are two fronts of the general commitment to restore national interest economics, and put a stop to the "markets-based" ruse behind which the "Houston cartel" of energy companies, and related formations of financial and political interests, are conducting unprecedented speculation, concentration of ownership, hyperinflation, and hyper-profiteering.

Context: Financial System in Breakdown

It is essential to understand the overall context of the energy crisis: The financial system itself is in breakdown. We are seeing the end phase of a period of "casino economy" bubbles—stock market valuations, debt pyramids of all kinds, futures, and derivatives speculation. Look at the spectacular blow-out of info-tech stocks, the foreign debt crises of major nations—from Argentina to Turkey, and the sweeping collapse of whole sectors of the economy, for example, the telecommunications sector. The U.S. manufacturing sector since last July has lost more than 600,000 jobs.

The actions of Federal Reserve Chairman Alan Greenspan, to lower interest rates and pump liquidity into the system, only create the conditions for worse breakdown ahead.

LaRouche is spearheading a collaborative effort to take nation-serving measures—such as energy re-regulation—to implement today a form of "New Bretton Woods" approach, like the steps taken to create a new financial system in the aftermath of World War II.

LaRouche described the significance of this for energy and general economics policy, in a

radio interview in Mexico May 28, broadcast in Leon, Guanauato:

“The essential thing is that there’s no possible way the present U.S. system, the present world system, can continue to function. It’s doomed. Nothing can save it. You can save the nations, but you can not save the financial system. All the leading financial institutions of the United States are presently hopelessly bankrupt. You have the same situation in Japan, you have the same situation in continental Europe.

“What you can do, is, you can put the whole world through bankruptcy reorganization. That’s the only solution, which means cancelling most of the debt, especially the financial derivatives and similar debt. Most of the foreign debt of the Ibero-American nations will have to be cancelled. And then, what this New Bretton Woods means, is, going back to 1945, to the legacy of Franklin Roosevelt, to create the kind of system we had between 1945 and 1958, and continuing into the middle of the 1960s.

“In other words, that means fixed exchange rates, that means capital controls, it means exchange controls, it means financial controls within and among governments. It means a protectionist policy on trade and tariffs. The best example is the Monnet Plan, the relationship between the United States and Europe during the immediate, first 15 years after World War II. There are a few differences today, but in principle, that plan, that method will work. The difference is that we have to apply it on a global scale, not just a transatlantic scale. The issue is, finding the political will to do that.”

Re-Regulate Energy, Restore the General Welfare

To mobilize support for the “political will” to back proven policies of the FDR legacy, Lyndon LaRouche, who has declared as a candidate for the 2004 Democratic Presidential nomination, in May issued a mass-circulation pamphlet, “Join LaRouche’s Battle for the Common Good.”

In brief, the essential measures there proposed to bring the “California” hyperinflationary energy crisis under control are listed immediately below.

- Completely re-regulate all electrical power generation and distribution, including just and reasonable pricing, on the principle of the General Welfare established in the 1935 regulatory acts—the Public Utility Holding Company Act, and the Federal Power Act.
- Apply the principles of Chapter 11 bankruptcy to those generating utilities, gas works, industrial concerns, and institutions ruined by deregulation. Apply the necessary state powers of eminent domain to regain regulatory control of power plants which are being used by robber baron “marketers” to loot the states’ productive powers.
- Issue emergency, low-interest credit from government to industry, dedicated to the purpose of production of new, high-productivity power-generating capacity.

The “Houston Cartel”

In direct opposition to the principles embodied in the “General Welfare” approach, stand those interests and companies constituting what’s now come to be called the “Houston Cartel.”

Under deregulation, Houston, Texas is quickly developing a reputation for being one of the most notorious havens for pirates since the heyday of the Barbary Coast. Led by the politically well-connected Enron, with its revolving-door relationship to the first and last Bush Administrations, this “Houston Cartel” has skimmed billions of dollars in revenue from the monies Americans have

paid for electricity in recent years.

Besides Enron, whose chairman Ken Lay seems to function as a sort of unofficial Secretary of Deregulation and Globalization for the energy cartel, there is James A. Baker III's Reliant Energy, which charged California an obscene \$1,900 per megawatt-hour of electricity; El Paso Corp., which is under criminal investigation by the Federal Energy Regulatory Committee for illegal price-fixing in the California natural gas market; and Dynegy, which is nearly one-third owned by oil giant Chevron.

Other members of the "Houston Cartel" include Duke Energy, based in Charlotte, N.C. and formed by the merger of Duke Power and Houston's PanEnergy; Atlanta's Southern Company and its Mirant Corp. spinoff; and Virginia-based AES Corp. Duke performed the seemingly impossible task of making Reliant look good, when it charged California \$3,880 per megawatt-hour for electricity which was desperately needed to avoid a blackout.

Record Profiteering

These companies, several of whom are under investigation by State and Federal authorities, have made record profits, as have their elder cousins, the giant oil multinationals. According to the Department of Energy's Energy Information Administration, the major U.S. energy companies took in \$264 billion more in revenue in 2000 than they did in 1999. Most of that money came out of the pockets of ordinary Americans, who have seen their electricity, heating, and gasoline bills soar, the result of a deregulation scam which was sold to a gullible public as a way to lower prices.

But electricity deregulation was never intended to lower prices—it was intended to insert a financial middleman between the producers of electricity and the consumers, to rake off a portion of the trillions of dollars Americans pay for energy each year. These are not energy companies, but speculators who are in the energy business in the same way that a gambler is in the poker or blackjack business. Enron is more of an investment bank than an energy company, with a trading floor to rival any on Wall Street.

Behind the "Houston Cartel" stands what we call "Southern Strategy, Inc.," the corporate, financial, and political interests which are using this energy money machine to shift the center of power in the U.S. from the industrialized North to the post-industrial South. The power does not come from the South, but rather flows through it, from the House of Morgan networks of Wall Street, the Boston Vault, the City of London, and the Anglo-French Lazard and Schlumberger interests.

In the short run, this looting machine is pumping billions of dollars into the collapsing global financial bubble, but the damage it does is greater than its benefits, even to the bubble.

In the long run, this new "market-based" energy-pricing system is designed to provide the financier oligarchy with a steady income stream, during and after the bursting of financial bubbles. That is why the "Houston Cartel" is so determined to stick with its looting system, even though it—and deregulation—have so obviously failed.

Scope of Destruction

Chain reactions of economic shutdown are now running throughout the U.S. economy, directly due to the last 15 months of energy hyperinflation of all kinds. In transportation, surcharges for higher fuel prices have been widely imposed. The higher natural gas prices have slammed industry. Nitrogen fertilizer—whose feedstock is natural gas—has risen in price over 100%, has hit

agriculture, hard-pressed by the diesel fuel rise. School districts, hospitals, water systems, churches, and all kinds of vital institutions and services are facing budget-busting energy costs.

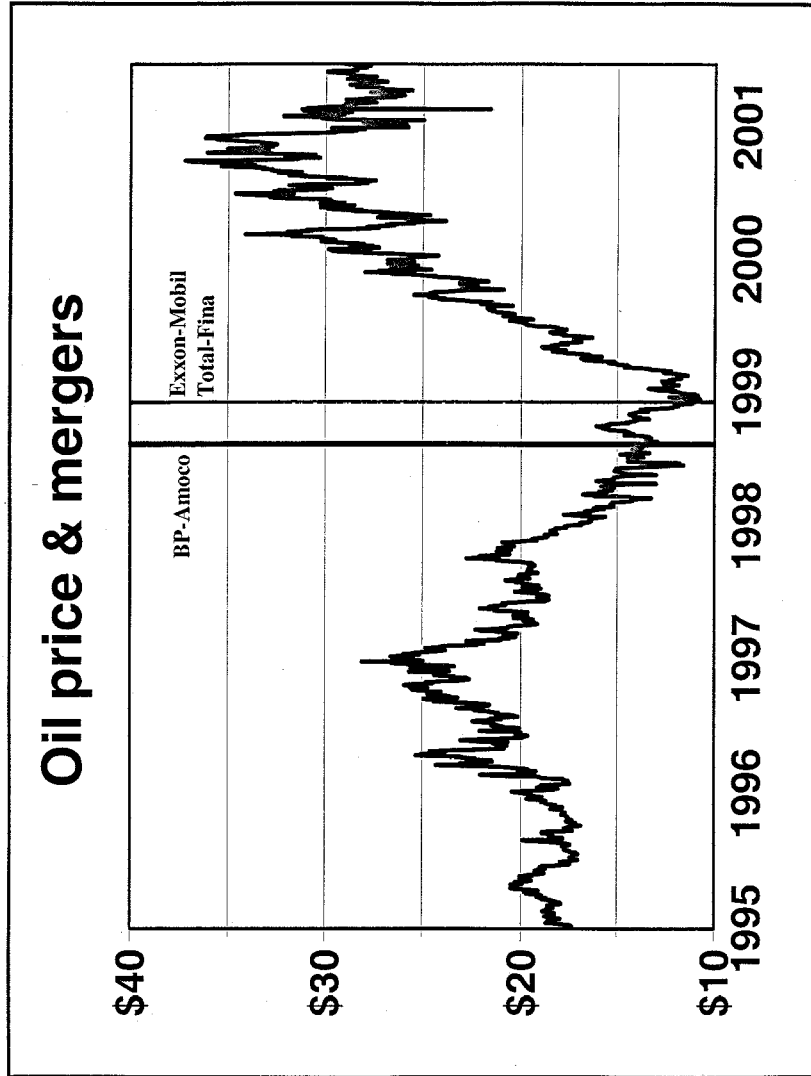
Residential energy costs are in crisis. The National Energy Assistance Directors Association (NEADA) June 11 survey reports low-income customers in 19 states and D.C. have arrearages totaling almost \$910 million owed by 4.3 million families. Out of 14,694 residential customers in D.C. 5,229 have received shut-off notices; in New Jersey it is 276,715; over 150,000 in Pennsylvania; almost 37,000 in South Carolina; 20,000 in Virginia; and 55,000 in West Virginia, according to NEADA estimates.

NEADA also reports that their Low Income Home Energy Assistance Program (LIHEAP) funds are exhausted and/or very low in the 19 states and D.C., thereby jeopardizing assistance for cut-offs, and summer cooling programs will not be available in many states.

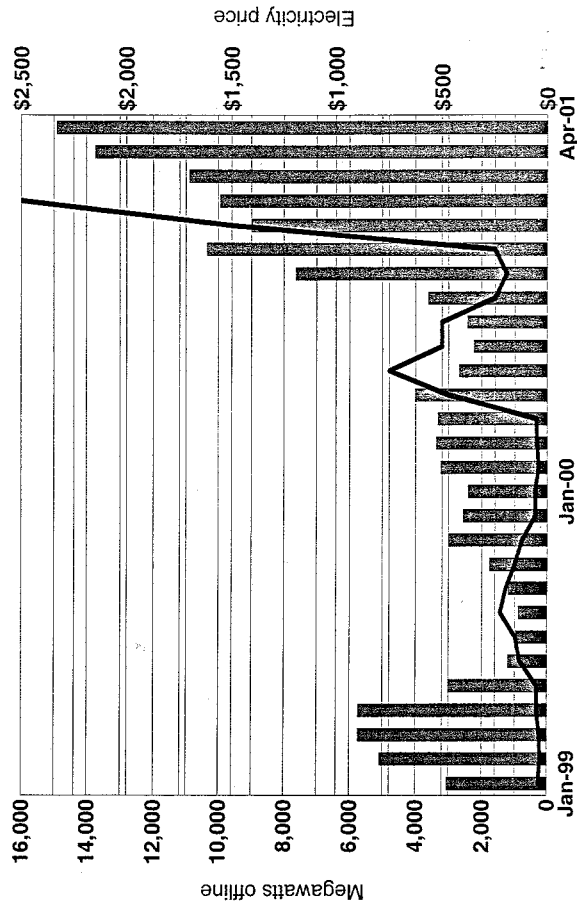
As of mid-May 2001, an unprecedented 7-10 million Americans face energy cut-offs as winter energy bills soared, causing these low-income families to accumulate huge arrearages.

International Mobilization

Congressional action to implement measures to re-gain control over runaway energy prices, and otherwise act to serve the public good, will be directly in line with recent international initiatives that are in the direction of restoring real economic growth. On the Eurasian continent, multinational commitments have been announced in recent months for new rail projects, intended as corridors of development. Lyndon LaRouche, who has campaigned for this Eurasian "Land-Bridge" perspective in recent years, said the May 28 Mexico radio interview, that such projects are a "motive for changing the financial system. You see, the only way we're going to get an economic recovery is by having, as I've said, a New Bretton Woods type of reform. But that will not spontaneously solve the problem. What we need is large-scale projects, especially infrastructure projects, which will drive a real, genuine global economic recovery."

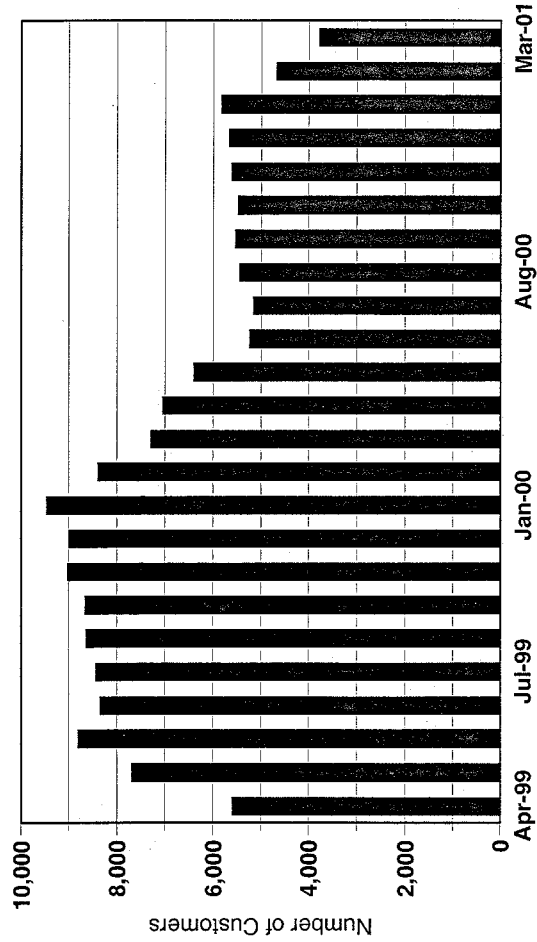


Energy pirates withhold electricity to jack up prices in California



Sources: California Energy Commission, California Power Exchange, University of California Energy Institute

Competitive Generation Customers in Massachusetts



Source: Massachusetts Division of Energy Resources

**Profit increases at selected energy companies
2000 over 1999**

Company	Increase
EOG Resources	570%
Unocal	436%
Williams	277%
Apache	259%
Phillips	250%
Calpine	238%
Kerr McGee	218%
Dynegy	210%
Occidental	176%
AES	165%
Conoco	149%
Texaco	139%
Chevron	138%
BP pic	129%
Exxon Mobil	102%
Shell	85%
Reliant Energy	65%
Dominion	36%
Enron	32%
Coastal	31%
Duke Energy	18%
Southern	3%

Source: Company reports



GOVERNOR GRAY DAVIS

To Senator Joe Lieberman & Members of the Senate Governmental Affairs Committee:

I submit for your consideration this report on California's energy crisis.

The State of California is moving at light speed to meet the energy challenge and take control of its own energy future.

As you know, there are two things the state can do: build more power plants and increase conservation. We are making great progress on both.

But wholesale energy prices are the exclusive responsibility of the federal government.

As far back as April 1999, I began implementing a long-term plan for energy prosperity.

Today, we've approved 16 new major power plants and are building more plants than at any time in our history. We're the most electricity-efficient state in the nation. And we've reduced our reliance on the volatile spot market with long-term energy contracts.

Without short-term relief from the federal government, however, our long-term financial health will be significantly endangered.

With rates skyrocketing, blackouts looming, one utility in bankruptcy and another on the brink, California can't afford to wait one or two years. We need relief today.

Repeatedly – and inexplicably – the Federal Energy Regulatory Commission has refused to fulfill its legal duty and provide relief from prices that even FERC itself has determined were “unjust” and “unreasonable” (11/01/00 & 12/15/00).

On behalf of the 34 million people of the great state of California, I thank you for your willingness to hold FERC accountable.

I hope that you will take steps to ensure that, in the future, this Commission keeps faith with the public trust by upholding its legal mandate and protecting our nation's ratepayers from price gouging and market gaming.

Sincerely,


GRAY DAVIS

STATE CAPITOL • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841



California's energy crisis is one of the most serious challenges our state has faced in decades.

Already, it has crippled our two largest utilities, and forced the state to step in and pay more than \$7 billion out of the treasury to cover the costs of electricity.

While the crisis began in the West, its widening impact will affect businesses and consumers all across this country. This is a national economic issue.

As Federal Reserve Chairman Alan Greenspan observed earlier this year, "It is scarcely credible that you can have a major economic problem in California which does not feed to the rest of the 49 states."

The good news is that California's energy problems can be solved. And the state is doing everything within its power to solve them.

As far back as April 1999, Governor Davis began implementing a comprehensive long-term energy plan. Today, that plan is bearing fruit: more power, lower demand, less reliance on the volatile spot market and reduced (but far from reasonable) wholesale prices.

The bad news is that California cannot solve all of its energy challenges by itself. Its consumers and businesses need federal action.

Here's why: California's energy mess is an economic issue of supply and price.

The state can meet the challenge of supply on its own – and it is.

Wholesale prices, on the other hand, are exclusively within the control of the Federal Energy Regulatory Commission.

In the face of sky-high prices, FERC has refused to follow the law requiring the Commission to protect consumers from "unjust and unreasonable" electricity prices.

Generation

For the 12 years before Governor Davis took office, not a single power plant was built in our state. Not one.

But, beginning in April 1999, the Davis Administration righted the course, moving expeditiously to bring plants on-line.

It cut approval times in half and licensed 16 major power plants. 10 are under construction. 4 will be online this summer. We've also approved 10 new "peaker" plants.

The Governor also signed legislation establishing the California Consumer Power Authority to build, own and operate new power plants on behalf of consumers.

All of this, California did without weakening its historic commitment to clean air and water.

Conservation

While we augment our energy supply, we're also reducing our demand, setting new national standards for energy efficiency.

In April, Governor Davis signed an \$850-million conservation program – the nation's largest – into law.

This followed his Executive Order, offering a 20-percent rebate to consumers and businesses that conserved 20 percent during the summer months of 2001.

In addition to reducing its own energy use up to 25 percent, the state has entered into conservation partnerships with hundreds of companies, business associations and local governments.

The measures have had an immediate impact.

In May alone, Californians conserved 11 percent, enough electricity to power the entire San Diego Gas and Electric service area at peak.

Today, California is the most electricity efficient state in America. And it's conserving more every day.

Stabilization

On January 17, 2001, the State of California stepped in to purchase the power the utilities could no longer afford to buy. As a result, the state was able to keep the power on and the economy growing.

Since then, we've moved aggressively to lock up long-term power at lower prices and, as a consequence, reduced our reliance on the volatile spot market.

Governor Davis has used his emergency powers to seize control of existing low-cost contracts that the utilities intended to forfeit to the generators.

Since the Administration began purchasing power, the average price paid per megawatt hour has dropped.

Of course, a stable energy market requires viable utilities.

The state has worked to restore the utilities to financial stability.

On April 9, 2001, the state announced a Memorandum of Understanding with Southern California Edison on the key principles of a balanced recovery agreement.

In June, the state negotiated an agreement between Edison and the state's "Qualifying Facilities" that will increase supply and bring back on-line facilities that were shut down because of economic reasons. It is estimated that the agreement will save the state \$100 million by the end of 2001.

On Monday, June 18, 2001, the state announced a second MOU – with San Diego Gas & Electric. This time, California negotiated a \$747-million balloon payment owed by San Diego ratepayers down to zero, with no increase in rates.

Demand for Federal Action

California continues to address the energy crisis in a variety of ways. The state's available resources have been pressed into service. California is doing its part: generation, conservation, stabilization.

It is now time for the federal government to do its part.

Since the Federal Power Act of 1935, wholesale price regulation has been the exclusive domain of the federal government.

The law requires FERC to protect consumers from “unjust and unreasonable” electricity prices.

FERC has already made this determination in two separate orders, dated November 1 and December 15, 2000.

Despite these findings, FERC lifted the hard price cap of \$250 per megawatt hour that had been in effect, allowing the energy companies to set their own prices.

The result is that the same electricity that cost Californians an average of \$30 a megawatt in the spring of 2000 skyrocketed to \$1,500 for the same megawatt of power this spring on the spot market.

At one point in January, Duke Energy charged the state an outstanding per-megawatt record of \$3,880, and just last month, Reliant Energy charged \$1,900 per megawatt.

Exorbitant prices aren't limited to electricity.

In November 2000, natural gas prices in California began diverging from the rest of the nation.

Since then, California has faced natural prices 2-3 times higher than the national average.

Californians believe in free enterprise. But, the fact is that California's energy market is not a “free” market.

Power generators and sellers are able to exert market power over California's energy market, driving up prices.

A recent study by the California Independent System Operator identified a huge price markup over the competitive cost of electricity in the months of March, April and May of this year.

In other words, there were forces greater than supply and demand contributing to the artificially high price of electricity during those months. That force was market power.

As a result, unplanned outages within privately-owned power plants have increased exponentially. By taking plants off-line, generators are able to suppress supply.

During January-April 2000, the average number of megawatts held off-line ranged from 2,400 to 3,400. During the same period this year, the average was nearly 10,000 in January, 11,000 in February, 14,000 in March, and 15,000 in April.

In addition, the state Department of Water Resources has reported that off-line capacity this June is running at a much higher level than in previous years.

All the while, FERC refused to exercise its legal responsibilities.

The result is that in 1999, California paid roughly \$7 billion for all its electricity. Last year, the figure shot up to \$27 billion. This year, even though we're using less electricity, estimates suggest total spending may hit \$50.

Cal ISO, the agency that runs California's power grid has identified approximately \$9 billion in overcharges to California, much of it from out-of-state energy companies who clearly manipulated the system.

To redress this unprecedented transfer of wealth away from California ratepayers, California requested – and was denied – refunds going backward and temporary price relief going forward.

Temporary price relief is the way to reduce – though by no means eliminate – the charging of unjust and unreasonable electricity prices. It would not preclude generators from continuing to reap profits, nor would it deter investment in new power generation.

Because the outrageous prices charged by the energy companies have crippled two of our largest utilities, the state has been forced to step in and pay \$7 billion out of its treasury to cover the costs of electricity.

Ultimately, these costs must be paid back to the state treasury through a bond issue that will be retired by the ratepayers.

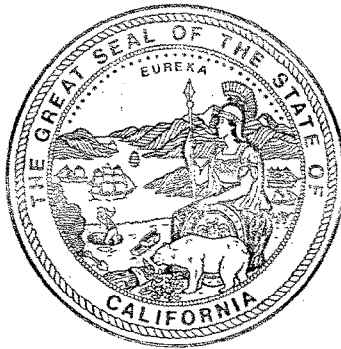
To date, no money has been refunded to California despite the findings that the state was being charged “unjust and unreasonable” prices for electricity.

FERC must move quickly and order the energy companies to refund the billions of dollars Californians were overcharged.

575

MEETING THE ENERGY CHALLENGE

HOW THE STATE OF CALIFORNIA IS TAKING
CHARGE OF ITS ENERGY FUTURE



GOVERNOR GRAY DAVIS,
STATE OF CALIFORNIA

SUBMITTED TO:

THE SENATE GOVERNMENTAL AFFAIRS COMMITTEE
THE HONORABLE JOSEPH LIEBERMAN, CHAIRMAN

JUNE 20, 2001



MEETING THE ENERGY CHALLENGE: A PLAN OF ACTION

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Generation -- 72

Actions taken:

1999 – 2001 Legislation Signed By Gov. Davis To Increase Generation Through Expedited Permitting And Other Incentives:

- Expedite Permitting For New Baseload Plants To 120 Days
- Waiver Of Standby Charges For Distributed Generation
- Incentives For Renewable Generation Through Net Metering
- Loan Guarantees For Renewable And Distributed Generation
- Grants For Solar Systems
- Permit Use Of Backup Generation
- Establishment Of A Public Power Authority To Build Power Plants

Executive Orders To Expedite The Permitting Of New Power Plants, And Permit Maximum Output From Existing Power Plants:

- Allow Emergency Peaking Facilities To Be Permitted In 21 Days
- Establish Power Plant Construction Performance Awards
- Shorten Local Review Period For Siting New Power Plants To 7 Days
- Expedite Permitting To Increase Output Of Existing Power Plants
- Require Regional Air And Water Agencies To Modify Permits To Allow Maximum Generation From Existing Power Plants
- Expedite Amendments From Simple Cycle To Combined Cycle Power Plants To Eliminate Delay In Construction

Results

List of approved power projects

Chart: Davis Administration has licensed more power plants than any Administration in history

Chart: 2000-2004 Generation Progress Report

Table: Energy Facility Filing Status

Conservation -- 89

Actions Taken

Conservation Measures

Legislation Signed By Gov. Davis To Reduce Energy Demand And Increase Efficiency:

- Over \$850 Million General Fund For Emergency Energy Efficiency Projects, Generation And Low-Income Assistance
- Extension Of The Public Goods Surcharge And Loan Programs To Fund Energy Efficiency Measures
- Increased Energy Efficiency Standards In Buildings

Executive Orders To Reduce Demand And Incentives For Conservation:

- 20 Percent Rate Reward Program For Residents And Businesses
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CALIFORNIA'S ENERGY STORY

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California's Energy Story

A Chronology 1976-2001

Produced by the Governor's Office of Communications
with assistance from the Governor's Office of Planning and Research,
The California Public Utilities Commission,
and The California Energy Commission
Updated May 4, 2001

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A Chronology 1976-2001

Produced by the
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California's Energy Story, 1976-2001

Pre-deregulation Years 1976-1990

California's current electricity crunch had its roots in an oversupply of electricity for the state in the mid-1980s. Prior to 1976, the state's public utilities had sole control over the production and distribution of electricity in the regions they served. The utilities owned the power plants and the transmission and distribution lines. The California legislature determined what it saw as a fair profit margin for the utilities and empowered the Public Utilities Commission to plan for long-term power needs and to oversee the utilities' rate structures and operations.

In 1976 California made its first significant break from the public utility monopoly structure.

In 1976 California made its first significant break from the public utility monopoly structure. The state enacted legislation encouraging private energy producers to develop sources of non-fossil fuel generated electric energy (wind, solar and the like) and sources of natural gas independent of the state's public utilities and to require the utilities to provide transmission access for these independent energy producers.

Shortly thereafter, in 1978, President Carter signed the Public Utilities Regulatory Policies Act (PURPA) which encouraged development of electrical generation from non-utility sources – cogeneration, geothermal, wind, biomass and other non-utility generation, commonly called Qualifying Facilities (QFs). The law allowed these independent producers to sell directly to large industrial customers and utilities. The PUC began developing QF standards for California.

From 1985-1990, the utilities did not propose construction of new power plants in California.

By 1984 QF projects totaling more than 10,000 megawatts were either on line or had signed delivery contracts to the utilities. Concerned that the process placed no limits on the amount of QF capacity the utilities would have to buy, the PUC suspended the contract structure. Negotiations between the utilities, the independent energy producers and the PUC began again.

From 1985-1990, the utilities did not propose construction of new power plants in California. Conservation programs and the availability of low-cost surplus power from the Southwest and Pacific Northwest reduced the need for additional utility plant construction. The Southwest had overbuilt its electricity supply system with coal-fired plants to meet a projected energy demand that did not materialize. This created an over-capacity that allowed California utilities to purchase power

Executive summary

From 1990-1996 just nine small power plants were built, producing just 952 megawatts.

for less than 1 cent/KWh.

From 1990-1996 the continuing uncertainty about the future regulatory structure and the need for additional generating capacity slowed additional plant development. During this period the California Energy Commission certified just 12 small power plants. Of these, three were never built. Nine of the plants are now in operation producing a total of 952 megawatts. Negotiations over the price to be paid for electricity from the QFs added to the uncertainty.

In 1992 President Bush signed the Comprehensive National Energy Policy Act which gave transmission grid access to independent power producers, enabling merchant generators operating private, for-profit power plants to sell electricity on the open market. The law also deregulated the natural gas market. This accelerated the pressure for California's electric deregulation.

In this atmosphere, deregulation advocates gained ground, citing the high prices paid by California consumers – particularly large commercial customers – for electricity, which remained well above the cost the utilities paid for generating or purchasing the power. In the years leading up to deregulation California was consistently among the top ten states for home, commercial and industrial retail electricity costs.

The Road to Deregulation

In 1992 when PUC issued a policy paper exploring deregulation as an option for California

The course toward deregulation really began in 1992 when the PUC issued a policy paper exploring it as an option for California. PUC commissioners went to the United Kingdom to study the deregulation effort there. In February 1993 the PUC issued the "*Yellow Book*," *California's Electric Services Industry: Perspectives on the Past, Strategies for the Future*. This document provided a comprehensive review of regulatory conditions and future trends facing the electric services industry.

In April 1994 the PUC issued its "*Blue Book*" setting guiding principles for deregulation: no cost shifting among customer groups, preservation of the utilities' reasonable opportunity to earn a fair rate of return, continuation of public purpose programs and the continuation of safe, reliable, reasonably-priced, environmentally sensitive electric service.

In August/September 1995 the PUC identified two proposals, a preferred industry structure for a wholesale power pool, and an alternative for consumer choice through direct access. Ultimately the PUC established principles that would lead to

Executive summary

The PUC established principles that would lead to the market separation between grid operations and market makers.

the market separation between grid operations and market makers – the Independent System Operator and the Power Exchange.

In December 1995 the PUC issued its final policy decision requiring utilities to apply at FERC to establish a new market structure (ISO/PX). The decision discussed market power and the need for a level playing field. It required utilities to divest themselves of at least 50 percent of their fossil generating assets, and provided an incentive for additional plant divestiture. In April 1996 the utilities filed applications with FERC to transfer control of the transmission system and establish the ISO and PX.

In August 1996 the Legislature passed AB 1890 without a dissenting vote, ratifying the PUC's plan for a PX to create a wholesale electricity market, and an ISO.

AB 1890 (Brulte) became the legislative vehicle for deregulation in June 1996. The bill promoted the establishment of a competitive electric generation market and direct access. It authorized stranded cost recovery for utilities, mandated open, non-discriminatory access to transmission and distribution services and supported the creation of the PX and ISO, continued funding for conservation, research and development, and subsidies for renewable energy resource development.

In August 1996 the Legislature passed AB 1890 without a dissenting vote. Governor Wilson signed the bill on September 23. It ratified the PUC's plan for a PX to create a wholesale electricity market, and an ISO to manage operation of the transmission grid. It also called for state-backed bonds to "securitize" stranded costs and secure a promise for a 10-percent rate reduction for residential and other small customers through March 31, 2002 (or earlier if the utility's stranded generation costs had been covered).

During the period 1996-1998 the Federal Energy Regulatory Commission (FERC) approved utility transfers of control of transmission systems to the ISO. The PUC began a "roadmap" process to implement direct access and stranded costs recovery with a target date of January 1, 1998. The PUC approved rate reduction bond financing providing utilities with up front funding for a portion of their stranded costs. Direct access began. Customers could opt to leave utility service for direct-access contracts with other suppliers.

There was a hiatus in power plant construction from 1995-1998 as power plant developers and utilities waited to see how the deregulation law would be implemented, and how they would be compensated for construction costs. During that period the utilities sold 18,393 megawatts of generating assets to independent, unregulated companies.

Executive summary

April 1999 – present

The wholesale market price for electricity, which averaged 3.5¢ per KWh in 1999 increased 10-fold in 2000 to 30¢ per KWh, with peak 2000 prices rising to \$1.50 per KWh.

Since April 1999, the Energy Commission has approved 16 new major power plant projects.

Since April 1999, the Energy Commission has approved 16 major new power plant projects.

Ten power plants are under construction, four are due to be completed in the summer of 2001, four more in 2002.

During the summer and fall of 2000 the governor's staff held periodic discussions on the growing cost of electricity and issues surrounding the energy shortage. In early fall members of the governor's senior staff began a series of meetings with the investor owned utilities over settlement of the utilities' lawsuits to recover uncovered costs of wholesale electricity.

It was not until late November 2000 that the utilities, during settlement meetings, broached the possibility that they faced insolvency in early 2001. During November the electricity supply available to the state remained sufficient, though spot wholesale prices began to rise. In December the shortage became significant as an increasing number of power plants were taken down for unscheduled maintenance.

It was not until late November 2000 that the utilities told the Governor's Office they faced insolvency in early 2001.

Wholesale spot prices for electricity skyrocketed in the days immediately after December 8, 2000, the day when FERC ordered Cal ISO to lift its \$250/MWh cap. FERC instead imposed a "soft" cap under which any deals exceeding \$250/MWh would be subject to refund if they were found to be excessive. On Tuesday, December 12 the peak spot price for power through the PX shot up to \$988. This compared to the average electricity price of \$30/MWh a year earlier. Also on December 12 natural gas, which had sold at \$3 a year prior was selling at \$60, a 2,000 percent increase.

AB 1890 was a bipartisan effort

The legislation passed both houses of the Legislature without a dissenting vote (Assembly: 73-0 on June 27, 1996; Senate: 40-0 on June 24, 1996) and was signed into law by Governor Pete Wilson.

"Every time a resident of this state flicks on the electric switch, they pay 40

Executive summary

percent more than residents across the United States," said Governor Wilson, who led an active effort for passage. "The legislation I am signing will end that by ushering in a new era of competition, making California the first state to dismantle its electric monopoly."

Deregulation legislation passed both houses of the Legislature without a dissenting vote and was signed into law by Governor Pete Wilson.

PUC actions on forward and bilateral contracts

In December 1995 as deregulation approached, the PUC issued a decision requiring utilities to buy and sell power through the PX, and prohibiting them from purchasing power from sources outside of the PX via so-called bilateral contracts. The utilities had to buy on the PX's spot market because the PX did not offer power at guaranteed prices.

In May of 1999 the PX made the first move to break with this policy. The PX requested and received authority from FERC to allow the utilities to sign contracts through the PX for power in blocks of a month ahead rather than buying spot power each day.

On July 8, 1999 the PUC authorized SCE and PG&E to purchase block forward power through the PX up to approx. 2,000 MW. This was about 1/3 of the utilities' minimum load.

On March 16, 2000 the PUC authorized PG&E and SCE to increase their block forward purchases through the PX up to the level of the "net short." (The Net Short is the additional electricity above that the utilities generate or have under contract.)

In July 1999 the PUC reversed a 1995 decision and began allowing the utilities to purchase power on contract.

On April 25, 2000 FERC approved a request by the PX to allow the utilities to purchase forward contracts for ancillary services (those needed as standby power in case of an outage).

On July 21, 2000 PG&E & Edison filed emergency motions seeking authority to buy power outside of PX in bilateral contracts for energy, capacity & ancillary services with the same volume limits as the block forwards. Two weeks later, on August 3, the PUC Commission approved the PG&E and Edison July 21 emergency motions to enter into bilateral contracts for full net short requirements.

From August to November the utilities entered into bilateral contracts for substantial amounts of long-term power. During this period the Western Power Trading Forum (the energy marketers' trade organization) consistently opposed granting

Executive summary

From August to November 2000 the utilities entered into bilateral contracts for substantial amounts of long-term power.

the utilities the authority to operate in the bilateral and block forward markets.

Edison sought additional authority on November 22, 2000 to enter into bilateral contracts. The utility requested automatic approval of such authority with no additional Commission action. Here, Edison was seeking authority that would have allowed it to enter into the buying and selling of speculative electricity contracts for power beyond that it needed to supply its own customers. On December 29, the PUC's Energy Division denied Edison's request for automatic approval of additional authority, stating that Commission must issue an order following a normal review process. Soon thereafter in January 2001 this issue became moot when the Department of Water Resources began direct purchases of electricity.

January 18-19, 2001 were the last dates that the PX sold market electricity. The PX announced that its operations were winding down.

On March 9, 2001 the PX filed for bankruptcy.

Actions by the Davis Administration

Governor Davis has taken a long series of actions to stabilize the state's electricity structure, enhance energy conservation and bolster electrical generating capacity.

Stabilization

Key rate stabilization initiatives include:

Gov. Davis' Actions to stabilize the state's electricity structure, enhance energy conservation and bolster electrical generating capacity.

- SB31X, authorizing the issuance of revenue bonds to fully reimburse the State General Fund for power purchases.
- Assembly Bill 1X, signed by the Governor on February 1, which allowed the state to enter into long-term contracts. Its credit worthiness allows the state to purchase electricity at a better price than the utilities.
- An on-line energy auction for generators to submit bids to provide electricity in long-term contracts.
- Agreements with generators for long-term, low cost power contracts for up to 10 years.
- A 10-year, \$7 billion agreement with Sempra Energy to supply the state with up to 1,900 MW.

Executive summary

Gov. Davis signed legislation replacing the Independent System Operator's stakeholder board with more independent leadership.

\$494 million in new conservation initiatives will augment the \$424 million in existing programs already funded by the Administration.

- Negotiations to reduce the price of power delivered by co-generation and renewable energy suppliers (qualifying facilities).
- Seizure of inexpensive energy contracts of Southern California Edison and Pacific Gas & Electric that otherwise would have been auctioned off.
- A new law making the Independent System Operator truly independent, replacing its stakeholder board with more independent leadership.
- A new law to prohibit utilities from selling off any more of their power plants without further approval of the state.

Conservation

On February 1, 2001, the Governor unveiled a conservation campaign. \$494 million in new conservation initiatives will augment the \$424 million in existing programs already funded by the Administration.

New initiatives in the Governor's energy efficiency campaign include:

- \$50 million for energy-efficient household appliances.
- \$60 million for high efficiency lighting.
- \$35 million for demand responsive systems.
- \$35 million for real-time or time-of-use meters.
- \$50 million in low-interest loans for energy efficiency in schools and local jurisdictions.
- \$90 million for agricultural programs.
- \$50 million for innovative peak load reduction programs.
- \$40 million to increase energy efficiency in state buildings.
- \$240 million for low-income assistance and weatherization programs, to protect those ratepayers least able to pay.
- \$105 million for renewable and other clean distributed generation projects.
- \$20 million for a paid media campaign coordinated by the Department of Consumer Affairs. State agencies and departments will support this effort

Executive summary

Actions by Governor Davis will ensure that all generation measures maintain California's commitment to clean air and the environment.

- with coordinated public outreach.
- \$7 million for school classroom education on energy.
- Partnerships with over 220 cities, counties, and local governments, as well as a host of business organizations including the grocers, the retailers, the Chamber of Commerce and the Silicon Valley Manufacturing Group.
- Announced the signing of a "Declaration of Action" by over 130 business leaders to reduce electricity use by 20 percent.
- A partnership between BOMA, SEIU, and other groups to reduce energy at over 3 million square feet of office space.
- A web site to make finding energy rebates easier, www.flex.ourpower.ca.gov/rebates.

An executive order requiring all retail establishments to significantly reduce outdoor lighting during non-business hours.

The Governor also signed an executive order requiring all retail establishments to reduce outdoor lighting during non-business hours to a fraction of maximum capability.

Governor Davis has also announced a legislative package to provide incentives to power up more renewable energy, distributed generation and co-generation.

Generation

Since April 1999, 16 new major power plants have been licensed. Ten are under construction.

Under Governor Davis' emergency powers and proposals California will streamline efforts to bring an additional 20,000 MW online by summer 2004. By summer 2001, California should have another 4,000 MW in new power generation on line.

Actions by Governor Davis will ensure that all generation measures maintain California's commitment to clean air and the environment. He has appointed a Clean Energy Green team to oversee the permitting and construction process.

Governor Davis has also announced a legislative package to provide incentives to power up more renewable energy, distributed generation and co-generation.

Governor Davis and his Administration have:

Governor Davis has signed a number of Executive Orders to expedite the permit-

Executive summary

*Governor's Clean Energy
Green Team works to
streamline the process of
siting new power plants.*

ting of new power plants. The Executive Orders:

- Allow emergency peaking facilities to be permitted in 21 days
- Establish Power Plant Construction Performance Awards
- Shorten local review period for siting new power plants to 7 days
- Expedite permitting to maximize generating output at existing facilities
- Allow gas-fired plants to operate at maximum levels
- Require regional air and water agencies to modify permits to allow maximum generation from existing power plants
- Expedite amendments from simple cycle to combined cycle power plants to eliminate delay in construction

Governor Davis signed legislation to increase generation through expedited permitting and other incentives:

- Expedite permitting for new baseload plants to 120 days
- Waiver of standby charges for distributed generation
- Incentives for renewable generation through net metering
- Loan guarantees for renewable and distributed generation
- Grants for solar systems
- Permit use of backup generation
- Establishment of a public power authority to build power plants

Since January, the Davis Administration has signed long-term contracts. XX percent of California's demand has been removed from being subjected to the fluctuating spot market.

Governor Davis and his Administration have also:

- Met with representatives of power generators, Qualifying Facilities, and municipal utilities to discuss energy issues.

Executive summary

- Created an acceleration bonus for developers to complete construction on new plants by July 2001.
- Directed State and local agencies to streamline the review and permit process for new baseload facilities that can come on line during peak demand periods in 2002.
- Organized "energy fair" workshops to bring together plant owners, utilities, and state agencies, to discuss permitting options for "peaker" plants.
- Released a report by the California Energy Commission identifying 32 potential locations for the siting of "peaking" plants.
- Taken steps toward providing low-interest financing for new peaking facilities and the "re-powering" of existing ones.
- Appointed a Clean Energy Green team and Energy Construction Czar to oversee the permitting and construction process.
- Encouraged construction of new renewable energy sources through rebates, commercial loan guarantees, and tax credits toward purchase and installation of renewable energy systems.
- Coordinated power plant maintenance schedules through the Independent System Operator to ensure maximum operating capacity.
- Expedited state review of permits for improvement of natural gas pipelines to increase access to natural gas.

Governor's Clean Energy Green Team

On September 6, 2000 Governor Davis signed Assembly Bill 970 establishing the Governor's Clean Energy Green Team which works to streamline the process of siting new power plants. The Green Team does this by coordinating the siting and permitting activities of local government, state and federal agencies, developing siting guidance, identify environmental impacts, developing guidance on gas supply, emission offsets and water supply and developing recommendations for low-

Executive summary

interest loan programs for renewable energy

The Green Team had the responsibility to "devise strategies for bringing additional fossil fuel and renewable power sources on line in California without compromising laws governing the environment, public health and safety and public participation. In addition, the Governor asked the Green Team "for innovative ways to cut red tape while protecting public health and safety and... for new ideas to finance renewable energy supplies."

California's Energy Story 1976-2001

Detailed Chronology

Pre-deregulation years 1976-1990

In 1978 President Carter signed the Public Utilities Regulatory Policies Act which encouraged development of electrical generation from non-utility sources

1976: California enacted legislation encouraging private energy producers to develop sources of non-fossil fuel generated electric energy (such as solar and wind generation) and sources of natural gas independent of the state's public utilities and to require the utilities to provide transmission access for these independent energy producers.¹

1978: Congress passed and President Carter signed the Public Utilities Regulatory Policies Act (PURPA) which encouraged development of electrical generation from non-utility sources—cogeneration, geothermal, wind, biomass and other non-utility generation, commonly called Qualifying Facilities (QFs). Under PURPA state regulators were to determine the price private utilities must pay for such power. The law allowed independent producers to sell directly to large industrial customers and utilities.

(This was major break from past law under which regulated utilities retained monopoly control over all generation.)

1978: The California Public Utilities Commission (PUC) began to develop standards under which investor-owned utilities would be required to purchase power from the QFs. Concurrently, the California Energy Commission set a goal to reduce the proportion of the state's electricity generated by oil and natural gas to no more than 33 percent by 1990.

1981: The PUC authorized investor-owned utilities to spend about \$50 million annually on conservation programs.

1982: In the face of claims that the utilities were not fairly negotiating with QF proponents, the PUC developed 3 standard contracts with prices based on the short-run "avoided cost"—the cost a utility would pay to purchase or generate the power in the absence of the QF. For purchases based on long-run avoided cost—the cost a utility would incur to build new generation—the PUC required negotiations among stakeholders to develop a standard contract. These 4 contracts became available for QFs such as cogeneration from facilities including lumber mills, food processors, refineries, and oil fields. The standard contracts provided for short-term, as-

Pre-deregulation years 1976-1990

During 1985-90 the PUC's continuing conservation programs and the availability of low-cost surplus power from the Southwest and Pacific Northwest reduced the need for additional utility plant construction.

available power purchases; short-term, firm power purchases, and an interim long-term contract. The interim long-term contract included fixed prices based on utility fuel price forecasts and 15-30 year terms. A final long-term contract was to be approved by 1985. By the end of 1982, 1,500 megawatts (MW) of QF power was signed up with energy prices tied to short-run costs.

1983: After negotiations held at the PUC among stakeholders, interim contracts became available for major QFs such as cogeneration from facilities including lumber mills, food processors, refineries, and oil fields. These offered long-term standard contracts with fixed prices and 15-30 year contract terms. Final long-run contract offers were intended to be approved by 1985.

1984: QF projects totaling more than 10,000 MWs had either come on-line or had signed contracts, greatly exceeding expectations.

1985: The PUC suspended the availability of the standard contracts with fixed price components in recognition of the fact that QF development was outstripping the utilities' resource requirements. Absent suspension of the availability of the contracts, the utilities would have had to buy all the power produced by contracting QFs even if the power generated by the QFs was beyond the utilities' need. Negotiations for a final long-term contract continued.

1985-1990: The fossil-fired independent power plant developers with projects 50 MWs or larger that had already signed contracts before the contract availability was suspended applied to the Energy Commission for licenses. The Energy Commission licensed 24 power plants during this period, adding 2,800 MW to the California grid. Many of these were cogeneration units. During this period, no utility-owned power plants were proposed in California. The PUC's continuing conservation programs and the availability of low-cost surplus power from the Southwest and Pacific Northwest reduced the need for additional utility plant construction. The Southwest had overbuilt their electricity supply system with coal-fired plants to meet a projected energy demand that did not materialize. This created an over-capacity that allowed California utilities to purchase power for less than 1 cent/KWh.

Pre-deregulation years 1976-1990

From 1990-96 regulatory uncertainty and the growing movement toward deregulation continued to discourage plant development.

1985-1991: The PUC, through a series of thirteen decisions, developed the terms and conditions of the final long-term contract for QF sales to investor-owned utilities. The PUC demand-side management collaborative brought together state agencies, consumers, and industry stakeholders. The collaborative lead to PUC decisions that increased energy efficiency investments by utilities, providing shareholder incentives for effective demand-side management.

1990-1996: A number of factors continued to discourage new generating plant development. Regulatory uncertainty regarding the specific amount of additional generating capacity needed and the specific methods for implementing the 1991 law contributed to the uncertainty. In early 1992, the PUC ultimately required the investor-owned utilities to open the final long-term contract for bidding to procure up to 1,500 MW from QFs.

1991: California enacted legislation that required that electric generation procurement include a value for the environmental and diversity costs and benefits associated with various generation technologies, or to set aside a specific portion of future capacity need to be met by renewable resources (Statutes of 1991, Ch. 1023).

The road to deregulation

In 1992 President Bush signed the Comprehensive National Energy Policy Act, giving grid access to independent power producers including merchant generators.

1992: President George Bush signed H.R. 776, the Comprehensive National Energy Policy Act, which gave transmission grid access to independent power producers including merchant generators that sought to build plants that would sell electricity on the open market. The legislation also deregulated the natural gas market. This accelerated pressure for California deregulation.

1992: The PUC issued a policy paper exploring deregulation as an option for California. PUC commissioners went to the United Kingdom to study the deregulation effort there.

1993: In February 1993, the PUC issued the "Yellow Book," *California's Electric Services Industry: Perspectives on the Past, Strategies for the Future*. This document provided a comprehensive review of regulatory conditions and future trends facing the electric services industry. The overriding goal was to craft a regulatory approach that recognized the competitive challenges facing the industry while upholding the Commission's responsibilities to ensure safe, reliable, nondiscriminatory electric services. The "Yellow Book" kicked off extensive public comment and a full panel hearing process that culminated in the issuance of the "Blue Book" in 1994.

April 1994: The CPUC issued the "Blue Book." This comprehensive review of the electric restructuring posed several issues for comment based on the central premise that command and control regulation was no longer appropriate as generation became subject to increasing competition among energy service providers. The Blue Book established guiding principles: no cost shifting among customer groups, preservation of the utilities' reasonable opportunity to earn a fair rate of return, continuation of public purpose programs and the continuation of safe, reliable, reasonably-priced, environmentally sensitive electric service.

May 1994: Legislative hearings began on the PUC's recommendations.

June 1994: ACR 143 was passed, directing the PUC to issue no interim, final or effective order in specified proceedings relating to the regulation of the electric services industry until it held evidentiary hearings and made spe-

The road to deregulation

In December 1995 the PUC required the utilities to divest themselves of at least 50 percent of their fossil fuel generating assets, and provided an incentive for divestiture.

cific reports to the Legislature and the Governor.

1995-1996: Numerous pieces of legislation were introduced to address electric utility deregulation.

February 1995: FERC overruled the PUC and blocked the building of new, cleaner power plants in California. FERC ruled that the PUC's process for setting rates for the alternative generators violated federal law because it ordered utilities to purchase electricity at rates above the cost the utilities would have incurred if they had generated the power themselves. FERC issued a stay effectively suspending deadlines for signing of contracts with the alternative generators.

May 1995: The PUC issued a draft policy decision adopting a "Poolco" approach. Poolco included the ISO and the PX in its structure and was comparable to the Pennsylvania, Maryland and New Jersey (PJM pool).

August/September 1995: A PUC ruling identified two proposals: the preferred and alternative proposed policy decisions. The preferred industry structure proposed a wholesale power pool and the alternative recommended consumer choice through direct access. In September 1995, Edison, California Large Energy Consumers Association (CELCA), California Manufacturer's Association (CMA) and Independent Energy Producers (IEP) filed a MOU that recommended a market structure that contained features of both. Comments were received in October 1995 and November 1995. The MOU adopted by CPUC abrogated "Poolco" and established principles that would lead to the current market structure (market separation between grid operations and market makers — ISO and PX).

December 1995: The PUC issued its Final Policy Decision which authorized utilities to apply at FERC to establish a new market structure (ISO/PX). It discussed market power and the need for a level playing field, required utilities to divest themselves of at least 50 percent of their fossil generating assets, and provided an incentive for divestiture. The decision also provided utilities with the opportunity to recover stranded assets through transition costs at a reduced rate of return and proposed a shift in public purpose programs to an independent administrator.

The road to deregulation

In summer 1996 the Legislature passed and Governor Wilson signed AB 1890, the electricity restructuring bill that formally deregulated electricity in California.

February 23, 1996: AB 2940 (Brulte) was introduced to confirm the statutory basis for the PUC's order facilitating the state's effort to implement electrical restructuring.

March 1996: The PUC reaffirmed the policy of the Western Power Exchange "Wepex" process to create the ISO and PX and establish a trusteeship to oversee the formation of these entities. This process used a consensus-based approach to implementation and served as a working group to facilitate filings at FERC to establish the ISO and PX.

April 1996: Utilities filed applications with FERC to transfer control of the transmission system and establish the ISO and PX.

May 22, 1996: AB 2940 died on the Assembly Floor.

June 1996: The PUC ordered the utilities to fund trusteeship and proceed at FERC.

June 1996: AB 1890 (Brulte) became the legislative vehicle for deregulation and Governor Wilson and legislative leaders agreed to convene a Conference Committee on Electric Restructuring. AB 1890 generally supported the establishment of a competitive electric generation market; provided direct access; authorized stranded cost recovery for utilities; mandated open, non-discriminatory access to transmission and distribution services; supported the creation of the PX and ISO and continued public purpose programs.

July 1996: The PUC ordered utilities to provide the funding to establish the ISO and PX.

August 28, 1996: AB 1890 Conference Committee on Electric Restructuring released its report.

August - September 1996: The Legislature passed and Governor Wilson signed AB 1890, the electricity restructuring bill authored by Assemblyman Jim Brulte (R-Rancho Cucamonga) and Senator Steve Peace (D-La Mesa). Assembly Bill 1890 reaffirmed the broad outlines of the Decem-

The road to deregulation

From 1995-1998 the hiatus in power plant construction continued as power plant developers and utilities waited to see how the deregulation law would be implemented

ber 1995 *Final Policy Decision* issued by the PUC. It ratified the PUC's plan for a Power Exchange to create a wholesale electricity market, and an Independent System Operator (ISO) to manage operation of the transmission grid. It also called for state-backed bonds to "securitize" stranded costs and secure a promise for a 10-percent rate reduction for residential and other small customers through March 31, 2002 (or earlier if the utilities had recovered their stranded costs).

October 1996: FERC issued order #888 and #889, the final orders in the mega-NOPR (Notice of Proposed Rulemaking) which firmly established the federal support for formation of the independent system operator competitive wholesale energy markets.

October 1996: FERC approved utility transfers of control of transmission systems to the ISO.

January 1997: The PUC began a "roadmap" process to implement direct access and stranded costs recovery with a target date of January 1, 1998.

September 1997: The PUC approved rate reduction bond financing providing utilities with up front funding for a portion of their stranded costs.

April 1998: Direct access began. Customers could opt to leave utility service for direct-access contracts with other suppliers.

December 1998: The PUC approved SCE's power plant divestitures.

March 1999: The PG&E power plant divestiture approved.

1995-1998: There was a hiatus in power plant construction during this period as power plant developers and utilities waited to see how the deregulation law would be implemented, and how they would be compensated for construction costs. After deregulation the utilities sold 18,393 megawatts of generating assets to independent, unregulated companies.

April 1999 – present: Since April 1999, 16 new major power plants have been licensed. Ten are under construction.

The road to deregulation

Since April 1999, the Energy Commission has approved 13 new power plant projects with a combined generation capacity of 8,449 megawatts.

It was not until late November 2000 that the utilities, during settlement meetings, broached the possibility that they faced insolvency in early 2001.

Under Governor Davis' emergency powers and proposals California will streamline efforts to bring an additional 20,000 MW online by summer 2004. By summer 2001, California should have another 4,000 MW in new power generation on line.

During the summer and fall of 2000 the governor's staff held periodic discussions on the growing cost of electricity and issues surrounding the energy shortage. In early fall members of the governor's senior staff began a series of meetings with the investor owned utilities over settlement of the utilities' lawsuits to recover uncovered costs of wholesale electricity.

July 2000: San Diego Gas and Electric rate freeze ended. Retail power rates in San Diego tripled.

It was not until late November 2000 that the utilities, during settlement meetings, broached the possibility that they faced insolvency in early 2001. During November the electricity supply available to the state remained sufficient, though spot wholesale prices began to rise. In December the shortage became significant as an increasing number of power plants were taken down for unscheduled maintenance.

Wholesale spot prices for electricity skyrocketed in the days immediately after December 8, 2000, the day FERC ordered Cal ISO to lift its \$250/MWh cap. FERC instead imposed a "soft" cap under which any deals exceeding \$250/MWh would be subject to refund if they were found to be excessive. On Tuesday, December 12 the peak spot price for power through the PX had shot up to \$988. This compared to the average electricity price of \$30/MWh a year earlier. Also on December 12 natural gas, which had sold at \$3 a year prior was selling at \$60, a 2,000 percent increase.

AB 1890 passed both houses of the Legislature without a dissenting vote (Assembly: 73-0 on June 27, 1996; Senate: 40-0 on June 24, 1996) and was signed into law by Governor Pete Wilson.

The *San Diego Union-Tribune* reported on August 28, 1996: "Gov. Pete Wilson has played a key role in crafting the fundamental framework for restructuring

AB 1890 was a bipartisan effort

AB 1890 passed both houses of the Legislature without a dissenting vote and was signed into law by Governor Pete Wilson.

California's electricity market as he brokered a political compromise between the two primary special-interest groups that dominate the California Legislature as well as the proceedings at the PUC: large industrial consumers and investor-owned electric utilities. . . . Assemblyman Jim Brulte, R-Rancho Cucamonga, also has played a major role in the deregulation debate, authoring a comprehensive restructuring bill. . . . Wilson has received more than \$450,000 from large industrial-utility customers during the last 2 1/2 years and almost \$120,000 from the state's three investor-owned utilities. Brulte has received more than \$175,000 from these concerns."

The *Public Utilities Fortnightly* reported on November 15, 1996: "Every time a resident of this state flicks on the electric switch, they pay 40 percent more than residents across the United States," Governor Wilson proclaimed. "The legislation I am signing will end that by ushering in a new era of competition, making California the first state to dismantle its electric monopoly."

The *San Diego Union-Tribune* reported on September 24, 1996: "At the bill signing here, [Governor Wilson] praised the Legislature for making 'California the first state to dissolve the electric monopoly, a truly historic moment.'" They also reported, "While other states have experimented with electrical deregulation on limited scales, California is the first to unleash competition statewide, said Dianne Dinstein of the California Public Utilities Commission. 'Californians need to understand that life is going to be very different come Jan. 1, 1998, and the five years following that as competition begins and is fully implemented,' Dinstein said. 'It will affect everyone in the state.'"

Electric Utility Week reported on September 30, 1996: "California Governor Pete Wilson last week signed what he called 'historic legislation' opening the nation's largest electricity market to competition. . . . He hailed the enactment . . . as the most significant bi-partisan legislative accomplishment of the year. 'We are shifting the balance of power in California,' Wilson said. 'We've pulled the plug on another outdated monopoly and replaced it with the promise of a new era of competition.'"

The *Orange County Register* on February 8, 2001, quoted former Governor Wilson: "I take credit, frankly, for having launched deregulation, for being the first in the nation. I was aware at the time I signed the bill that some of the compro-

AB 1890 was a bipartisan effort

mises made it less than a perfect piece of free-market legislation. Some mistakes were made, but I signed it because I was convinced we needed to get California launched on deregulation. And I counted on the Legislature and the Public Utilities Commission to remedy whatever flaws that they found." *The Register* added, "Wilson said one of the biggest mistakes was made by his appointees to the PUC, who opposed letting utilities buy power under long-term contracts - the very step the state is now taking to rein in soaring electricity costs."

December 1995: The PUC issued a decision requiring utilities to buy and sell through the Power Exchange (PX). It prohibited the utilities from purchasing power from sources outside of the PX via so-called bilateral contracts.

PUC actions on forward and bilateral contracts

In July 1999 the PUC approved SCE and PG&E requests to purchase PX block forward products up to approx. 2,000 MW.

August 1996: AB 1890 passed, effective January 1997, formally creating the PX.

March 31, 1998: ISO and PX Markets opened.

March 23, 1999: The PX, with support from the PUC filed a request with FERC for authority to offer block forward products, in effect allowing for the utilities to sign contracts for power in blocks of a month ahead rather than buying spot power each day. For instance, using this block forward system the utilities could have purchased 12 monthly blocks and cover a portion of their power needs for a full year ahead.

May 26, 1999: FERC approved the PX's March 23 request to offer block forward products.

July 8, 1999: The PUC approved the SCE and PG&E requests to purchase PX block forward products up to approx. 2,000 MW. This was about 1/3 of the utilities' minimum load. SCE had initially requested authority for bilateral contracts (contracts made outside the structure of the PX). As PUC Energy Division Director Paul Cianon testified on February 7, 2001², the PUC rejected this request in deference to the supposedly transparent market structure created in California through deregulation and at the federal level through FERC action.

December 30, 1999: The PX filed at FERC for new block forward products.

January 6, 2000: SCE requested authority to buy new PX products; and to increase volumes to "net short" requirements. (The net short is the additional electricity above that the utilities generate or have under contract.)

January 19, 2000: PG&E made the same request SCE had on January 6 to buy new PX products; and to increase volumes to "net short" requirements

March 16, 2000: The Commission approved PGE/SCE authority as requested January 6 and 19

March 21, 2000: Edison asked for authority to purchase PX forward ancillary

PUC actions on forward and bilateral contracts

<p><i>In July 2000 the Commission approved Edison and PGE requests for daily and balance-of-month forward contracts up to levels of actual requirements.</i></p>	<p>services. Ancillary services provide standby power to balance the electrical grid in case of an outage among the generators providing power.</p>
	<p>March 30, 2000: PG&E asked for the same authority as Edison had requested on March 21.</p>
	<p>April 25, 2000: FERC approved PX Ancillary Services application.</p>
	<p>May 2, 2000: The PX filed tariffs for daily and balance-of-month trading.</p>
	<p>May 4, 2000: The PUC approved Edison's March 21 request.</p>
	<p>May 17, 2000: SCE requested daily & balance-of-month forwards, and higher trading limits, with per se reasonableness of all new PX products.</p>
	<p>May 19, 2000: PG&E requested similar authority to Edison's May 17 filing.</p>
	<p>June 8, 2000: The Commission approved PG&E's March 30 request.</p>
	<p>June 8, 2000: The Commission issued an order permitting, among other things utilities to use exchanges other than PX (overturned by legislature shortly thereafter)</p>
	<p>July 6, 2000: Commission approved Edison and PGE May 17 and May 19 requests but did not permit procurement for speculation, at levels above actual requirements</p>
	<p>July 10, 2000: SDG&E sought additional authority to buy PX block forward products.</p>
	<p>July 21, 2000: PG&E & Edison filed emergency motions seeking authority to buy power outside of PX in bilateral contracts for energy, capacity & ancillary services with the same volume limits as the block forwards.</p>
	<p>August 3, 2000: The Commission approved SDG&E's July 10 request.</p>
	<p>August 3, 2000: The Commission approved PG&E and Edison July 21 emer-</p>

PUC actions on forward and bilateral contracts

In August 2000 the PUC approved PG&E and Edison emergency motions to enter into bilateral contracts for full net short requirements.

agency motions to enter into bilateral contracts for full net short requirements.

The PUC order granted SCE and PG&E authority to go out and sign bilateral contracts immediately, subject to later reasonableness review by the PUC. The PUC and the utilities never came to a formal agreement over the reasonableness issue, but the utilities quickly began signing bilateral contracts soon thereafter. (PUC confidentiality rules prohibit release of contract details including amounts of forward power purchased.) In its order the PUC noted that "reasonableness reviews will be implemented consistent with market standards."

Also during this period the Western Power Trading Forum (the energy marketers' trade organization) consistently opposed granting the utilities the authority to operate in the bilateral and block forward markets. The WPTF expressed concern over the amount of market power this would grant the utilities.

August 9, 2000: SDG&E filed an emergency motion for authority to sign bilateral contracts.

August 31, 2000: SDG&E received "trial bids" for bilateral contracts.

September 21, 2000: The PUC approved SDG&E's August 9 motion with no provisions for a pre-approval process.

September 22, 2000: Edison presented Commission staff with bilateral contract offers seeking pre-approval. The Commission may not delegate formal authority to its staff, and did not give a response beyond what it had announced in its August 3 order. On October 31, 2000 Edison sent a letter to Wes Franklin, CPUC, stating its understanding that September 22 contracts were deemed pre-approved by Commission inaction.

October 3, 2000: PG&E began entering into bilateral and block forward contracts for a significant portion of their net short for 2001.

October 16, 2000: PG&E sent a letter to PUC President Loretta Lynch request-

PUC actions on forward and bilateral contracts

In October and November 2000 the utilities began entering into bilateral and block forward contracts for a significant portion of their net short for 2001.

ing clarification or advice regarding the prudence requirements the PUC had placed on the utilities' bilateral contracting. As it did with the Edison letter, the Commission – which traditionally acts on such requests only in formal session – did not respond to PG&E, allowing its August 3 ruling to stand (taking the position that the ruling had already given the utilities necessary authority to contract for power). Subsequently, the Commission reopened the proceeding to clarify its August 3 order.

October 27, 2000: SDG&E began entering into bilateral and block forward contracts for a significant portion of its net short for 2001.

November 15, 2000: Edison began entering into bilateral and block forward contracts for a significant portion of its net short for 2001.

November 22, 2000: Edison sought additional authority to enter into bilateral contracts and requested automatic approval of such authority with no additional Commission action. Here, Edison was seeking authority that would have allowed it to enter into the buying and selling of electricity contracts speculatively.

December 29, 2000: Energy Division Director Paul Clanon denied Edison's November 22 request for automatic approval of additional authority and stated the Commission must issue an order on this request following a normal review process. Soon thereafter in January 2001 this issue became moot when the Department of Water Resources began direct purchases of electricity.

January 18-19, 2001: The last dates that the PX sold market electricity. The PX announced that its operations were winding down.

March 9, 2001: The PX filed for bankruptcy.

June 14, 2000: Called for emergency reduction of electricity use by all state facilities in the San Francisco Bay area.

June 15, 2000: Called on the California Public Utilities Commission (PUC) and the Electricity Oversight board (EOB) to analyze the conditions that led to

Actions by Governor Davis to meet California's energy challenge

In July 2000 Gov. Davis called on federal and state regulators to take swift action to extend the caps on wholesale electric rates in California.

electricity shortages in the San Francisco Bay Area. Report was completed, submitted to the Governor and released on August 2. The report by Energy Oversight Board Chairman Michael Kahn and Public Utilities Commission President Loretta Lynch made the following points:

- Sharply higher San Diego prices and Bay Area black-outs warrant major concern.
- The new structure of California's electricity market federalized electricity regulation and limited California's ability to protect California business and consumers.
- State decision-makers must tackle each of four separate components that jointly affect electricity reliability and prices.
 1. Enhance the state of California's ability to protect consumers and hold market players accountable.
 2. Revitalize California's commitment to clean, efficient energy use to improve electric system reliability.
 3. Address wholesale price volatility in an era of electricity shortages.
 4. Manage retail price problems until a market develops and is fully functional.
- Actions must be taken in three time-frames to implement the four recommendations.
 1. Respond to the immediate risk of system crisis;
 2. Act now on options that will improve California's readiness for Summer 2001;
 3. Discuss and decide throughout the next six months longer term options and policy choices that respond to system inadequacies.

July 27, 2000: Called on federal and state regulators to take swift action to extend the caps on wholesale electric rates in California and provide San Diego ratepayers with millions of dollars in refunds.

July 27, 2000: Requested a coordinated state effort urging federal regulators to take immediate steps to reduce power rates.

August 2, 2000: Issued three Executive Orders designed to reduce energy consumption by state government and speed up the time it takes new power generating facilities to win approval from state agencies.

August 9, 2000: Called on the PUC to establish a two-year plan that would cut electricity rates by nearly half for residential and business customers of San

Actions by Governor Davis to meet California's energy challenge

<p><i>September 6, 2000 Gov. Davis signed landmark legislation providing short-term relief to San Diego ratepayers.</i></p>	<p>Diego Gas & Electric.</p>
	<p>August 9, 2000: Announced an agreement with the California Grocers Association that will save enough electricity to power between 50,000 and 60,000 homes.</p>
	<p>August 10, 2000: Wrote a letter to President Clinton urging him to expedite the Federal Energy Regulatory Commission's investigation to determine whether current electric rates in San Diego were unjust.</p>
	<p>August 22, 2000: Called on President Clinton to release emergency funds from the Low-Income Home Energy Assistance Program (LIHEAP) to help low-income Californians pay their rapidly rising electricity bills. The President responded with \$2.6 million in emergency funds.</p>
	<p>September 6, 2000: Signed landmark legislation providing short-term relief to San Diego ratepayers and increasing the long-term power supply for all Californians.</p>
	<p>September 30, 2000: Signed a package of bills to expedite the permitting of new power plants, to promote energy efficiency and to encourage the use of renewable energy sources.</p>
	<p>November 9, 2000: Testified before FERC challenging its decision to strip California of wholesale price cap protection.</p>
	<p>November 14, 2000: Testified before FERC for the second time in a week asking the commission to order refunds to local consumers forced to pay skyrocketing prices and to institute hard price and bid caps.</p>
	<p>December 1, 2000: Responded to a draft FERC proposal. In a letter to the federal regulators, the Governor outlined a series of regulatory and legislative actions designed to keep the state's electricity prices at the lowest reasonable cost.</p>
	<p>December 8, 2000: Called on Congress to investigate FERC's lifting of wholesale price caps in California and warned he would seek to dismantle the current ISO and reconstitute it with a membership accountable to Californians.</p>

Actions by Governor Davis to meet California's energy challenge

In December 2000 Gov. Davis met with U.S. Federal Reserve Chairman Alan Greenspan and U.S. Secretary of Treasury Laurence Summers discuss California's energy challenge.

December 13, 2000: Met with U.S. Senator Dianne Feinstein, U.S. Energy Secretary Richardson, and FERC Chairman James Hoecker, to request price caps on wholesale power. Also requested an emergency order from Secretary Richardson requiring generators to continue supplying power to California.

December 14, 2000: Announced that Secretary Richardson had granted his request for the emergency order.

December 15, 2000: Called on the Attorney General to investigate the anti-competitive practices of natural gas suppliers that have caused huge price spikes in California.

December 16, 2000: Announced that he would call a special session of the Legislature and reserve \$1 billion in his 2001-02 Budget for these purposes:

- Replace the so-called stakeholders on the ISO Board with Californians who are more concerned about the prices consumers and businesses pay for power than they are about the profits their companies make.
- Re-establish the authority for the state to inspect private power plants to assure the coordination of maintenance and operating schedules.
- Provide low-interest financing for new peaking facilities or re-powering old ones to make them cleaner and more efficient in return for committing their power to Californians at guaranteed low rates.

December 19, 2000: Announced the award of \$7.1 million in Low Income Energy Assistance Program (LIEAP) emergency funds to aid low-income households facing continuing, substantial increases in home heating fuel prices.

December 26, 2000: Met with U.S. Federal Reserve Chairman Alan Greenspan and U.S. Secretary of Treasury Laurence Summers in Washington, D.C. to discuss California's energy challenge.

December 27, 2000: Met with President Bill Clinton to request an extension of the order requiring generators to sell power to California.

January 2, 2001: Announced that he would file a friend of the court brief in support of the lawsuit filed by Southern California Edison against FERC

Actions by Governor Davis to meet California's energy challenge

<p><i>In January 2001 Gov. Davis declared a special session of the California legislature to tackle energy-related legislation.</i></p>	<p>that charged that the federal agency with failing to protect ratepayers from record prices charged by energy generators.</p>
	<p>January 3, 2001: Declared a special session of the California legislature to tackle energy-related legislation.</p>
	<p>January 4, 2001: Called PUC decision on rates "unfortunately necessary."</p>
	<p>January 6, 2001: Announced that the California Energy Commission had licensed its ninth power plant since 1999.</p>
	<p>January 8, 2001: Outlined steps in his State of the State address to meet California's energy challenge.</p>
	<p>January 10, 2001: December 26, 2000: Met with U.S. Federal Reserve Chairman Alan Greenspan and U.S. Secretary of Treasury Laurence Summers in Washington, D.C. to discuss California's energy challenge.</p>
	<p>January 11, 2001: Announced that U.S. Department of Energy Secretary Bill Richardson would extend the department's emergency order requiring generators and marketers to make power available until Wednesday, January 17, 2001.</p>
	<p>January 12, 2001: Met with Washington State Governor Gary Locke and Oregon Governor John Kitzhaber to plan joint action of the Pacific Coast states to deal with soaring energy prices.</p>
	<p>January 12, 2001: Announced a sweeping plan to reduce California's energy use by at least five percent within one week. Included was a statewide public outreach campaign to promote energy efficiency, including a reduction of energy use by the Department of Water Resources, one of the state's largest users of electricity.</p>
	<p>January 13, 2001: Requested that President Clinton use his emergency powers to keep natural gas flowing to PG&E by using provisions of the Natural Gas Policy Act of 1978 to require out-of-state natural gas producers to continue to supply the utility.</p>
<p>January 17, 2001: Issued an emergency declaration that allowed the state to</p>	

Actions by Governor Davis to meet California's energy challenge

In January 2001 Gov. Davis issued an emergency declaration that allowed the state to purchase electricity to keep the lights on in California through the Department of Water Resources.

purchase electricity to keep the lights on in California through the Department of Water Resources.

January 17, 2001: Announced that California had exceeded its goal of reducing its energy use by more than five percent in one week, trimming 511,803 Megawatt hours of electricity use.

January 17, 2001: Requested and received an extension of Secretary Richardson's emergency order requiring generators to continue supply electricity to California's utilities.

January 18, 2001: Named Geoffrey Brown to the Public Utilities Commission.

January 18, 2001: Signed Senate Bills AB 5X, which replaced the existing governing board of the Independent System Operator (ISO), composed of 26 so-called "stakeholders," with a governing board composed of five members appointed by the Governor. These board members must be independent of any ISO market participant to ensure that the ISO Board is comprised of Californians whose primary concerns are affordable prices and reliability of power. The bill also prohibited the ISO from entering into a multi-state entity or regional organization unless such a move is approved by the Electricity Oversight Board (EOB). Also signed AB 6X, which required that public utility-owned generation assets owned by any utility prior to June 1, 1997, remain regulated by the California Public Utilities Commission (PUC) until the PUC authorizes their disposal. The bill further prohibited the sale of any public utility-owned power plant until January 1, 2006.

January 18, 2001: Named four members to the new board of the Independent System Operator (ISO). They include: Chairman Michael Kahn of the Electricity Oversight Board, Secretary of Business, Transportation, and Housing Maria Contreras-Sweet, Carl Guardino of the Silicon Valley Manufacturers Group, and Michael Florio of The Utility Reform Action Network (TURN).

January 19, 2001: Signed Senate Bill 7X, legislation he requested that authorizes the Department of Water Resources to buy and sell electric power and appropriates \$400 million from the General Fund to DWR for that purpose.

Actions by Governor Davis to meet California's energy challenge

In January 2001 the PUC approved \$314 million in funding for California's utilities to implement energy efficiency programs.

January 19, 2001: Asked Attorney General Bill Lockyer to file a motion with (FERC) to withdraw its order that would have allowed PG&E Corp. to restructure itself in a way that would shield the parent company's profits and shareholders from the utility's debts.

January 22, 2001: Announced the Department of Water Resources (DWR) would conduct Internet-based auction for long term electricity contracts. The contract bids will extend for six months, three years, five years, and ten years respectively.

January 24, 2001: Announced the appointments of Michael Peevey as special advisor to the Governor on energy, David Freeman as advisor to the California Department of Water Resources on long-term contracts, and Frank Zarb as advisor to the Governor on finance and markets.

January 26, 2001: Announced the framework of a rough consensus reached with bipartisan leadership of California's Senate and Assembly, covering plant siting, energy efficiency, negotiations on power pricing, unrecovered costs, and outstanding regulatory issues.

January 29, 2001: Named Michael Peevey, Michael Kahn, and Michael Kramer as California's team to negotiate with the investor-owned utilities in setting the terms and conditions of a public interest in the utilities.

January 31, 2001: In response to Governor Gray Davis' call to increase and promote energy efficiency, the California Public Utilities Commission unanimously approved \$314 million in funding for California's utilities to implement their energy efficiency programs in the State.

January 31, 2001: In a move to increase energy efficiency in buildings statewide, Governor Gray Davis announced that the California Building Standards Commission had adopted the nation's toughest energy efficiency regulations.

February 1, 2001: Outlined an \$800-million energy conservation program, including appliance rebates, incentives to reduce commercial lighting and a public media campaign. The Governor also announced he had signed an executive order, in consultation with state and local law enforcement officials, directing reductions in outdoor retail lighting by March 15, 2001.

Actions by Governor Davis to meet California's energy challenge

In February 2001 Gov. Davis outlined an \$800-million energy conservation program, including appliance rebates, incentives to reduce commercial lighting and a public media campaign.

February 1, 2001: Signed AB 1x authorizing the Department of Water Resources (DWR) to purchase the amount of electricity needed to serve California retail customers that utilities cannot provide from the utilities' own resources, and creating a mechanism to recover from the retail customers DWR's costs of such purchases.

February 1, 2001: Through the California Department of Conservation, announced \$2 million in grants that will allow Resource Conservation Districts (RCD) around the state to kick-start efforts that ultimately can lead to cleaner water, scenic preservation and improved natural wildlife habitat.

February 2, 2001: Responding to the denial of a court order preventing sale of inexpensive energy contracts by the California Power Exchange, Governor Gray Davis issued an executive order seizing the contracts owned by Southern California Edison in order to preserve their value for California consumers. The contracts represented 925 megawatts from Southern California Edison.

February 5, 2001: Responding to the denial of a court order preventing sale of inexpensive PG&E energy contracts by the California Power Exchange, Governor issued an executive order seizing an option to buy the contracts in order to preserve their value for California ratepayers. Those contracts included up to 500 megawatts from PG&E.

February 6, 2001: Announced that the Department of Water Resources had reached agreements on the commercial terms for its first long term supplies for electricity. Authorized by the passage of Assembly Bill 1X on February 1, the contracts represent the first step in the state's effort to secure electricity at reasonable prices.

February 7, 2001: Unveiled his plan to increase generating capacity by boosting output at existing power facilities, accelerating power plant construction, streamlining the review process for new facilities, and providing incentives for distributed and renewable generation. California will streamline efforts to bring an additional 20,000 megawatts online by July 2004, starting with 5,000 additional megawatts by July 2001 and 5,000 more megawatts by July 2002.

Actions by Governor Davis to meet California's energy challenge

In February 2001 Gov. Davis unveiled a utility recovery plan that included the purchase of their power lines and targeted revenue from the existing rate structure to help pay their back debt.

February 14, 2001: Announced a legislative package to provide incentives to power up more renewable energy, distributed generation and co-generation. The package included:

- \$50 million to increase rebates for renewable distributed generation systems smaller than ten kilowatts.
- A 50 percent tax credit for the purchase and installation of renewable distributed generation systems larger than 10 kilowatts and up to 200 kilowatts for large facilities such as apartment complexes and businesses. This was to be carried in SB 17x by Senator Jim Brulte (R-Cucamonga).
- \$50 million for a commercial loan guarantee program for renewable power systems, distributed generation and co-generation facilities. This was to be carried in AB 53x by Assemblymember Sarah Reyes (D-Fresno).
- \$20 million for retrofit of distributed generation owned by municipal water districts to improve environmental performance. This involves retrofitting diesel and dirty natural gas generators with clean natural gas technology.
- Elimination of the standby charges paid by renewable distributed generation end-use customers to the Investor Owned Utilities. This includes small co-generation facilities and only applies to units that generate less than one megawatt.

February 16, 2001: Unveiled the framework of a recovery plan for the California's investor-owned utilities that included the purchase of their power lines and targeted revenue from the existing rate structure to help pay their back debt.

Benefits of the plan to ratepayers and taxpayers included:

- A significant contribution by the parent companies to their utility subsidiaries to satisfy their creditors and return to financial viability;
- The extension of cost-based rates from the utilities' generating facilities from 5 to 10 years and a ban on their sale;
- Conservation easements on utility-owned land in prime watershed areas; and
- Dismissal of all pending litigation.

March 13, 2001: Announced that the first two proposals for power plants to provide electricity at peak use times this summer had been received by the California Energy Commission.

- A 90-megawatt plant called the Larkspur Energy Facility would be located in

Actions by Governor Davis to meet California's energy challenge

In March 2001 Gov. Davis issued an executive order implementing a 20/20 energy conservation rebate to reward consumers who cut back 20 percent from last summer's consumption.

the Otay Mesa area of the City of San Diego.

- The Indigo Energy Facility, a 135-megawatt plant that would be located near an existing wind generating facility in the City of Palm Springs in Riverside County.

March 13, 2001: Issued an executive order implementing a 20/20 energy conservation rebate. He announced that California ratepayers will receive a 20 percent rebate on their summer electric bill if they cut back their electricity use by 20 percent over last summer's levels. The "20/20" program is designed to help the state avoid the likelihood of blackouts this summer and reward consumers who significantly conserve energy.

March 16, 2001: Announced additions to the state's team of experts to help advise the state on implementing its energy strategy. The firms and the state departments for which they are working are:

Department of Water Resources -- The firms are assisting a variety of agencies. Under the terms of the contracts, the state may pay as much as \$51 million for legal, financial, and communications assistance, including up to \$40 million for a media campaign

- Deloitte & Touche Consulting Group — developing and implementing credit risk management policies. It also is providing assistance with long-term settlement and scheduling requirements.
- Electric Power Services LLC — negotiating for long term power acquisition, developing a portfolio of power, coordinating transmission debottlenecking and congestion management, and expediting new power supply augmentation.
- Navigant Consulting — assisting with the procurement of power supplies, including procurement methods and processes, assessment of capacity and energy supply procurement requirements, and contract negotiation.
- Richard Ferreira — assisting in drafting bid solicitations and contract language, and advising on strategies to obtain long term contracts at lower prices.

Department of General Services

- Hawkins, Delafield, and Wood — providing legal counsel on legislative, financing and power supply contract negotiations.
- McGuire & Co. Inc. — providing policy consulting, information dissemi-

Actions by Governor Davis to meet California's energy challenge

nation and public affairs guidance for the state's energy conservation outreach efforts.

- Edward Panelli/JAMS (Judicial Arbitration Media Services)— providing advice regarding pending litigation.
- Wilson, Sonsini, Goodrich & Rosati - legal services including review and advice regarding pending litigation.

Department of Finance

- Ruder-Finn Inc. — providing advice and counsel in maintaining and improving California's credit rating on Wall Street. With the Harbour Group in Washington, D.C., Ruder-Finn is also monitoring federal legislative and executive branch activity.

Department of Consumer Affairs

- Grey Worldwide — working for the Department of Consumer Affairs on a public outreach campaign on conservation.

Resources Agency

- Johnston & Associates - advising the State of California on its dealings with the Federal Energy Regulatory Commission (FERC).

March 20, 2001: Announced that the California Energy Commission has signed 12 grants and contracts totaling almost \$9.2 million to install "energy smart" technology in commercial and industrial buildings throughout the state.

March 22, 2001: Announced the licensing of three new power plants that will add 2,076 megawatts to the State's electricity supply - enough power to supply more than two million California homes: the 1,056 megawatt Mountainview Power Plant Project near San Bernardino, the 500 megawatt Western Midway-Sunset Power Project, and the 520 megawatt Blythe Energy Power Plant.

March 27, 2001: Announced that California State agencies were hosting a one-day workshop this week in Southern California to expedite the development of peaker power plants that will produce a thousand megawatts this summer. It brought together representatives of State agencies, investor-owned utilities, turbine manufacturers and suppliers, plant developers, and owners of sites on which temporary peaker plants can be placed.

Actions by Governor Davis to meet California's energy challenge

April 4, 2001: Announced that the first two peaker plants have been licensed under the California Energy Commission's expedited review process. The two power plants, located in Palm Springs and San Diego, will provide a total 225 megawatts of peak use power.

April 5, 2001: Addressed Californians via statewide radio and TV broadcasts on the history of the state's energy crisis and the actions he had taken in the areas of generation, conservation and stabilization. He noted that he had long been wary of consumer rate increases but had become convinced a carefully structured increase was necessary, saying: "So I'm urging the Public Utilities Commission to adopt a plan that will protect average consumers, reward those who conserve and motivate the biggest users to cut back. Under my proposal, more than half of you won't pay a penny more. For the rest, the average increase will be 26 and a half percent. For many of that group, rates will rise only about 10 percent. The heaviest users will see their rates rise 34 and a half percent on average. That includes business paying their share. This is in addition to the 9 percent surcharge we've all been paying since last winter."

April 6, 2001: Signed SB 43x by Senator Deirdre Alpert (D-Coronado) which extends the 6.5-cent rate freeze signed by the Governor last year to San Diego's large commercial and industrial customers, retroactive to February 7, 2001.

April 6, 2001: Stated regarding PG&E's bankruptcy, "Pacific Gas & Electric Co has dishonored itself. This action was unnecessary. They've caused undue alarm. PG&E was not pushed into bankruptcy but plunged themselves into bankruptcy for their own strategic advantage - not the best interests of the people of California. In contrast, PG&E's creditors have acted responsibly. They have had faith that this would be worked out through negotiations."

April 9, 2001: Announced an agreement between the Department of Water Resources, Southern California Edison, and Edison International. The agreement includes the three conditions outlined in the Governor's speech. Edison has agreed to:

- Use its generation assets to provide low-cost regulated power to the state

Actions by Governor Davis to meet California's energy challenge

for 10 years;

- Sell their transmission system for \$2.76 billion (2.3 times the net book value); and
 - Dismiss lawsuits seeking to significantly drive up electricity rates.
- In addition, Edison has agreed to:
- Commit the entire output of the Sunrise facility on a fixed price basis for 10 years. Under the agreement, Sunrise must be brought on-line by August 15th of this year or pay a \$2-million penalty;
 - Grant perpetual conservation easements: 20,600 acres of precious lands related to the Big Creek hydroelectric facility and another 825 acres related to Eastern Sierra;
 - Invest \$3 billion over five years into capital improvements; and
 - Edison's parent company will refund no less than \$400 million to Southern California Edison.

In return, the State will allow Edison to issue bonds for a substantial portion of its "net undercollection." The state will buy the net short through December 31, 2002. After that time, SCE will be responsible for covering the net short. The MOU also requires the utility to sell its hydroelectric assets to the state if the transmission sales does not occur within two years "for reasons beyond the parties' control."

April 10, 2001: Sent a letter to the Federal Energy Regulatory Commission (FERC) outlining California's efforts in response to the current energy challenge. The letter was submitted to the FERC during the Western Energy Issues Conference in Boise, Idaho for western state representatives. He commented that: "It has become increasingly clear that the Federal Energy Regulatory Commission's failure to control costs has precipitated an increase in rates to keep our lights on and our economy strong." He added that, "Although we cannot fix 12 years of inaction overnight, we are making real progress in California. It is critical that you fulfill your legal obligation to the people of California and the entire West to assure just and reasonable prices, and impose cost-based wholesale price controls at the earliest possible time."

April 11, 2001: Enacted an energy efficiency and demand reduction program by signing into law SB 5x, by Senator Byron Sher (D-Palo Alto), and AB 29x, by Assemblymember Christine Kehoe (D-San Diego). Together, the two bills provide over \$850 million for energy conservation and distributed

Actions by Governor Davis to meet California's energy challenge

generation programs designed to save over 2,000 megawatts for the summer of 2001.

April 12, 2001: Announced the licensing of the Hanford Energy Park Project in Kings County, a 99-megawatt natural gas-fired, combined cycle electricity generating facility proposed by the GWF Power Systems.

April 12, 2001: Directed the Energy Commission to use its emergency permitting authority to permit new peaking power plants that can be on-line by September 30, 2001. These peaker facilities can be set up quickly in a relatively small area with minimal field construction.

April 16, 2001: Named S. David Freeman as his chief energy advisor to lead the drive to implement energy conservation programs. Freeman will work with businesses, local governments, and citizens to direct the "20/20" program that offers consumers 20 percent off their summer electric bills if they cut their electricity use by 20 percent from June through September. He also will lead efforts to coordinate the implementation of an \$850 million initiative to promote aggressive conservation this summer and beyond. The new laws include programs to promote energy-efficient household appliances; high efficiency lighting in commercial buildings; and agricultural energy efficiency programs.

April 16, 2001: Praised Californians for slashing their electricity use by 9.2 percent in March. According to the California Energy Commission, state businesses and residents reduced electricity demand by 2,967 megawatts in March, up from the 8 percent savings of 2,578 megawatts in February, and the 2,091 megawatts or 6.2 percent reduction in January.

April 16, 2001: Announced the licensing of the Otay Mesa Generating Project, a 510-megawatt power plant proposed for the Otay Mesa area in western San Diego County.

April 18, 2001: Urged the California Energy Commission to approve construction of the Metcalf Energy Center, a proposed 600 megawatt power plant in southern San Jose.

April 16, 2001: Announced a 15/20 conservation award program for San Diego residents. Under the program, San Diegans who reduce their electricity by 15 percent will get a 20 percent rebate on their bills. Elsewhere in the state, ratepayers will have to reduce their electricity bill by 20 percent to receive the rebate. Governor Davis said that San Diego Gas and Electric

Actions by Governor Davis to meet California's energy challenge

customers reduced electricity use by about seven percent last summer (residential users 9%, 2.6% small commercial users, 6.0 percent major commercial and industrial). He has set a statewide goal of reducing energy use by 10 percent this summer from last year's levels. The rebate program will begin in monthly billing cycles that begin June 1 and end in September. Rebates for residences and small businesses will be based on a 15 percent reduction in total electricity use. For large businesses, the rebates will be based on a 15 percent reduction in peak load.

April 19, 2001: Met with members of California's Congressional delegation to outline his plans for increased power generation, additional energy conservation and long-term stabilization of the states utilities.

In his remarks afterward Gov. Davis noted: "I asked the Congress people to impress upon the Federal Government that they have a responsibility as well to conserve power. The State, during every stage two alert, conserves at least 20 percent. Our 34 million people in March conserved 9.2 percent. So we expect the Federal Government, using our own power grid here in California, to conserve at least 10 percent on a routine basis - and to join the state government in achieving a 20 percent savings every time we're under stage two alert.

"We also agree there has to be a mechanism that reduces the wholesale price of electricity. There has to be a mechanism that reduces the cost of transporting natural gas from our neighboring state into California. And we've agreed to work cooperatively across party lines to find ways we can reduce those costs because we all serve Californians, we're all one state, we're in this together, and party doesn't matter. Finding a solution does matter.

"Finally, we talked about the need to use temporary generation capability during the summer where companies could buy their own generators; hopefully driven by methane or natural gas but diesel during certain circumstances; probably during a stage three alert to minimize the potential for blackouts, to increase the probability that power will go where it's needed. To homes, businesses, hospitals, police and fire stations in California."

April 16, 2001: Announced he had appointed Ambassador Richard Sklar, an international expert on infrastructure development to lead a task force of internationally recognized engineering and project management firms to

Actions by Governor Davis to meet California's energy challenge

helpspeed the construction of new power plants in California.

April 25, 2001: Announced that two additional summer reliability power plants had been licensed under the California Energy Commission's expedited review process. Both of these single-cycle power plants, located in the City of Colton in San Bernardino County, will provide electricity at peak use times during the summer of 2001. Each project would be a distributed generation facility producing 40 megawatts of electricity by using four, 10-megawatt, simple-cycle gas turbine generators. The facilities are expected to be on-line by August 1, 2001.

April 26, 2001: Announced grants for two high tech companies which have agreed to slash their electricity use when the Independent System Operator (ISO) issues emergency alerts this summer. Sun Microsystems and the Hewlett-Packard Company will receive \$306,500 and \$422,000, respectively from the California Energy Commission to install smart energy technologies in their buildings. Both companies will shave off a combined 3.2 megawatts during the emergency alerts, enough power for 3,200 homes.

April 26, 2001: Signed three executive orders to increase stabilization, conservation and generation of power in California.

Executive Order D-34-01 -- Cut through red tape to speed up implementation of energy conservation programs outlined in SB 5X and AB 29X.

Executive Order D-33-01 -- Extended the conservation rebate of the "20/20" program to the customers in the territory serviced by the San Diego Gas and Electric Company.

Executive Order D-32-01 -- Ordered the transfer of funds from the Energy Commission to the Department of Water Resources for implementation of the power plant construction incentive program. Incentives will include:

- \$5,000 per megawatt (MW) of average electrical output on the first 100 MW and \$2,500 per MW for each MW above 100 MW, if brought on-line by July 1, 2001;
- \$4,000 per MW of average electrical output on the first 100 MW and \$2,000 per MW for each MW above 100 MW, if brought on-line between July 2, 2001 and August 1, 2001; and

Actions by Governor Davis to meet California's energy challenge

- \$3,000 per MW of average electrical output on the first 100 MW and \$1,500 per MW for each MW above 100 MW, if brought on-line between August 2, 2001 and August 31, 2001.

April 27, 2001: Announced that energy use in state office buildings dropped by an average of 20 percent during the first two months of 2001. In a survey of state office buildings' utility bills, state government reduced its energy consumption by an average of 19 percent in January 2001, and 21 percent in February 2001, as compared to the same month one year ago. As a result of these conservation measures in the office buildings surveyed to date, which represent over 11 million square feet, taxpayers have saved an estimated \$286,000 in utility bills from December through February.

April 27, 2001: Announced that local governments are partnering with the State of California by committing to energy conservation. He announced the state was entering into 225 conservation partnerships with cities, counties, and special districts.

May 2, 2001: Announced the licensing of the fifth summer reliability power plant that has been permitted under the California Energy Commission's expedited emergency review process. The plant is the 50-megawatt King City Peaker Power Plant in Monterey County. The Calpine King City Project, licensed for construction and operation on leased property adjacent to the existing King City Cogeneration facility at 750 Metz Road, expects to begin selling power under contract to the California Department of Water Resources by tsummer 2001.

May 2, 2001: Announced that California's overall energy use dropped by nine percent in April compared to one year ago. California residents and businesses reduced their electricity demand by 2,866 megawatts compared to last year, according to California Energy Commission figures, which include adjustments for weather and economic growth.

May 2, 2001: Met with representatives of Qualifying Facilities to discuss efforts to get their power back on line. The governor commented: "As you know, this is a gathering of people who are supplying power to the state through either renewable energy resources or cogeneration, commonly known as Qualifying Facilities. You represent about 30 percent about the power that the state buys. It is my hope that today we can work out any problems that still exist with you honoring the contracts that you have with Edison and PG&E and provide us power through out the year, particularly in the

Actions by Governor Davis to meet California's energy challenge

summer at affordable rates."

May 2, 2001: Issued an invitation to a dozen electrical generators and marketers to meet with him in Sacramento on May 9 to discuss California's energy crisis.

Invited were the Chief Executive Officers of Enron, AES Corp., Reliant, Dynegy, Duke, Mirant, Williams, Calpine, National Energy Group, Edison/Mission Energy, Sempra, and El Paso Natural Gas. The agenda included unpaid debts, credit, and the supply of power.

Governor Davis repeatedly called on FERC to do its job

Gov. Davis warned FERC that it must ensure that a workably competitive market exists before the state's consumers and economy are subjected to unconstrained market-based prices.

Governor Davis has repeatedly called on the Federal Energy Regulatory Commission to intervene and protect California ratepayers against unjust wholesale prices charged by merchant generators.

September 12, 2000 : At a FERC hearing in San Diego, Gov. Davis warned FERC that it bears a responsibility to ensure that a workably competitive market exists before the state's consumers and economy are subjected to unconstrained market-based prices.

November 9, 2000: In videotaped testimony before FERC in Washington, D.C., the governor warned that the electricity market envisioned in 1996 had failed to materialize. He said that FERC had found the state's electricity market was dysfunctional. "But you are not willing to do anything about it."

November 14, 2000: In testimony before FERC, Gov. Davis called on the commission to order consumer refunds and wholesale price caps. He said that refunds are due consumers who continue to be gouged by merchant generators. He called on FERC to "put in hard price and bid caps that will protect consumers until such time as the marketplace becomes competitive."

December 1, 2000: In a letter to FERC, Gov. Davis outlined the initiatives he was taking to ensure reliable and affordable electricity to Californians. He told FERC, "If you do your job of protecting consumers by rectifying the wholesale markets, the steps I have to take can be transitional and limited in scope."

December 8, 2000: Gov. Davis reacted to FERC's sudden lifting of wholesale price caps. "This ruling issued in the dark of night without notice to anyone in California is an outrageous assault on the consumers and businesses of California by a federal agency answerable to no one..." He remarked that California's ISO had sought this ruling without the authorization of its board of directors. He added that he was beginning the process to reconstitute the ISO board.

December 15, 2000: Gov. Davis charged that FERC's imposition of a \$150/MWH soft cap on wholesale electricity was an abdication of its responsi-

Governor Davis repeatedly called on FERC to do its job

*In March 2001, Governors
Davis, Locke of
Washington and
Kitzhaber of Oregon
wrote FERC requesting a
temporary price cap on
the cost of wholesale
power.*

bility to the people in the West. "They have chosen to ensure unconscionable profits for the pirate generators and power brokers who are gouging California consumers and businesses.

January 12, 2001: Governors Davis, Gary Locke of Washington and John Kitzhaber of Oregon agreed to joint action to deal with energy shortages and soaring prices. They issued a joint statement calling on the federal government to reassert cost-based price controls in the western marketplace or, at least, effective price caps.

January 19, 2001: Gov. Davis asked Attorney General Bill Lockyer to file a motion with FERC to withdraw its order allowing PG&E to shield parent company profits from the utility's debts. PG&E had filed the motion without notice to the governor or the PUC, precluding state review and participation. Gov. Davis stated.

March 3, 2001: Governors Davis, Locke of Washington and Kitzhaber of Oregon wrote FERC requesting a temporary price cap on the cost of wholesale power. They suggested a cost-based cap allowing generators to recover their costs plus receive a \$25/MWH profit. FERC Commissioner had made a similar proposal.

April 10, 2001: Sent a letter to the Federal Energy Regulatory Commission (FERC) outlining California's efforts in response to the current energy challenge. The letter was submitted to the FERC during the Western Energy Issues Conference in Boise, Idaho for western state representatives. He commented that: "It has become increasingly clear that the Federal Energy Regulatory Commission's failure to control costs has precipitated an increase in rates to keep our lights on and our economy strong." He added that, "Although we cannot fix 12 years of inaction overnight, we are making real progress in California. It is critical that you fulfill your legal obligation to the people of California and the entire West to assure just and reasonable prices, and impose cost-based wholesale price controls at the earliest possible time."

April 26, 2001: Issued the following statement on the Federal Energy Regulatory Commission's April 25 order:

Governor Davis repeatedly called on FERC to do its job

*In April 2001, Gov.
Davis commented,
"FERC had a chance to
bring meaningful relief
to California's
outrageous wholesale
prices and they blew it."*

"FERC had a chance to bring meaningful relief to California's outrageous wholesale prices and they blew it.

"It makes no sense whatsoever to condition the twelve months of relief proposed by the Federal regulators to California's willingness to join a regional organization that under the best of circumstances cannot be functional for another eighteen months.

"Last summer, the Federal government found that wholesale prices were unjust and unreasonable. They have yet to enforce their finding."

Governor's clean energy Green Team

The governor asked the Green Team for innovative ways to cut red tape while protecting public health and safety and for new ideas to finance renewable energy supplies.

On September 6, 2000 Governor Davis signed Assembly Bill 970 establishing the Governor's Clean Energy Green Team to streamline the process of siting new power plants. The Green Team coordinates the siting and permitting activities of local government, state and federal agencies, developing siting guidance, identify environmental impacts, developing guidance on gas supply, emission offsets and water supply and developing recommendations for low-interest loan programs for renewable energy

The Green Team has the responsibility to devise strategies for bringing additional fossil fuel and renewable power sources on line in California without compromising laws governing the environment, public health and safety and public participation. In addition, the Governor asked the Green Team for innovative ways to cut red tape while protecting public health and safety and for new ideas to finance renewable energy supplies.

During its first 90 days the Clean Energy Green Team releasing theses documents.

- December 2000: Financing Programs for Renewable Energy
- December 7, 2000: Energy Facility Licensing Process: Developers Guide of Procedures Staff Report/Draft
- November 2000: Water Supply Information, Staff Paper
- Staff Report: California Natural Gas Analysis and Issues Publication #200-00-006, 1996-2001
- November 30, 2000: Guidance Resources for Power Plants
- December 5, 2000 Energy Projects and Local Land Use Planning

Green Team Chronology

October 2000: Throughout the month of October met with renewable energy producers with projects pending in California. Met with legislative staff to update on Green Team activities.

October 11, 2000: Green Team public meeting held.

October 17, 2000: Presentation on Green Team at the Independent Energy Producers' Conference, Lake Tahoe, CA

Governor's clean energy Green Team

The Green Team coordinates linkages between local planning entities, "peaking" and renewable power plant developers and state entities responsible for regulatory and permitting issues.

November 2000: Throughout the month the Green Team met with renewable energy producers with projects pending in California. Green Team staff resolved outstanding permit issues for a 320 MW plant that will begin operation in July 2001. Met with numerous producers and developers of fossil fuel and renewable power generators.

December 6, 2000: Web Site launched directing potential power plant developers to the proper agencies for responses to questions regarding regulatory processes.

December 12, 2000: Made a presentation to California Foundation on the Environment and the Economy, Palm Springs, CA.

December 2000: Coordinated efforts to resolve air credit issue and succeeded in keeping power generators on line.

January 2001: The Green Team conducted four local government workshops: San Diego (January 12), Fresno (January 19), San Francisco (January 24) and Diamond Bar (January 30) to introduce and coordinate the linkages between local planning entities, "peaking" and renewable power plant developers and state entities responsible for regulatory and permitting issues. All workshops included respective air quality management districts and applicable state and federal agency representatives.

January 16, 2001: The Green Team made a presentation to the Base Commanders Conference, Monterey, CA

February 2001: Conducted ongoing dialogue with governmental agencies to resolve permit issues for 1,280 MW of peaking power and 100 MW of renewable power by summer of 2001.

Status of California power plant projects

In the early 1990s before the State's electricity generation industry was restructured, the California Energy Commission certified 11 power plants. Of these, three were never built due to market conditions. Eight plants are now generating 952 megawatts (MW) of electricity. Additionally, a project approved in 1994 has a 44 MW second phase now under construction, which is scheduled to be on line by May 2001. No power plant applications were filed with the Energy Commission between 1994 and 1997 because there was so much uncertainty during the restructuring of the electricity industry.

Since April 1999, the Energy Commission has approved 13 major new power plant projects with a combined generation capacity of 8,923 megawatts. Eight power plants, with a generation capacity of 5,587 megawatts are now under construction, with 1,903 megawatts expected to be on-line by the end of 2001.

In addition, another eleven major electricity generating projects, totaling 5,578 megawatts of generation and an estimated capital investment of nearly \$3.5 billion, are currently being considered for licensing by the Energy Commission. The Commission is also in the process of reviewing summer reliability electrical generation projects which can be on-line by September 30, 2001.

Baseload Power Plants Recently Approved

Blythe Energy Power Plant—a \$300 million, 520-megawatt, natural gas-fired combined cycle power plant will be located on privately owned lands near Interstate 10 and the Blythe Airport, approximately five miles west of the City of Blythe, in eastern Riverside County. The facility is expected to be on-line by March 2003.

Delta Energy Center—a \$450 million, 880-megawatt, natural gas-fired, combined cycle facility will be located on an undeveloped 20-acre parcel at the Dow Chemical Company plant, northwest of the adjacent Delta Diablo Sanitation District treatment facility in the City of Pittsburg. The expected completion date for this project is July 2002.

Elk Hills Power Project—a \$300 million, 500-megawatt, natural gas-fired, combined cycle, electricity generating facility will be built approximately 25 miles west of the City of Bakersfield in Kern County. The expected completion date for this project is the summer of 2002.

Status of California power plant projects

High Desert Power Project — a \$350 million, 720-megawatt natural gas-fueled electricity generation power plant is to be built on a 25-acre site within the northwest corner of the Southern California Logistics Airport, formerly the George Air Force Base, in the City of Victorville, San Bernardino County. The expected completion date for this project is Winter 2002.

La Paloma — a \$730 million, 1,048-megawatt natural gas-fired, combined cycle power generating facility is to be constructed 40 miles west of Bakersfield, approximately two miles east of the unincorporated community of McKittrick, Kern County. The expected completion date for this project is November 2001.

Los Medanos Energy Center — formerly known as the Pittsburg District Energy Facility project, this \$300 million, 500-megawatt electric generation facility would be located on 12 acres on the northwest corner of property owned by USS-Posco Industries on East 3rd Street in the City of Pittsburg, Contra Costa County. The project should start producing power in July 2001.

Moss Landing Power Plant Project — a \$500 million, 1060-megawatt, natural gas-fired combined cycle power plant will be located at the existing Moss Landing Power Project at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing, near the Moss Landing Harbor in Monterey County. The project is expected to come on-line in June 2002.

Mountainview Power Plant Project — a \$550 million, 1056-megawatt gas-fired combined cycle power plant will be built on a 16.3-acre site at the existing San Bernardino power plant, near the corner of San Bernardino Avenue and Mountainview Avenue, in an unincorporated section of San Bernardino County. The new facility should be on-line by April 2003.

Pastoria Energy Facility — a \$350 - \$450 million, 750-megawatt natural gas-fired, combined cycle generating facility proposed for an undeveloped site at Tejon Ranch. The proposed 30-acre location is adjacent to an existing gravel quarry approximately 30 miles south of Bakersfield, Kern County. The project is expected to be on-line in June 2003.

Sunrise Power Project — a \$180 million, 320-megawatt, single-cycle temporary "peaker" power plant that will be constructed in western Kern County, approximately 35 miles southwest of Bakersfield near Derby Acres. As a "peaker" plant, it has been licensed to operate until December 31, 2002.

Status of California power plant projects

At that time, the project must be shut down or converted to either a combined cycle or a cogeneration facility. The project should be on-line in time to generate and deliver power for the summers of 2001 and 2002.

Sutter Power Project—a \$300 million, 500-megawatt natural gas-fired, combined cycle plant is being built adjacent to the Calpine's Greenleaf Unit No. 1 facility on South Township Road near Yuba City, Sutter County. The project is expected to come on-line August 2001.

Western Midway-Sunset Power Project—a \$300 million, 500-megawatt, combined cycle, natural gas-fired electricity generating facility to be located near Derby Acres on a ten-acre site adjacent to the existing 225-megawatt Midway Sunset Cogeneration power plant approximately 40 miles west of Bakersfield, Kern County. It should begin producing electricity by March 2003.

Peaker Plant Approved (Non-Emergency Siting)

United Golden Gate Power Project—a 51-megawatt simple cycle power plant is being built for a site at the San Francisco International Airport in San Mateo County. The plant is owned and operated by El Paso Merchant Energy Company. This "peaker project" was part of a four month licensing process.

NOW ON LINE

Proctor and Gamble Phase 2—certified in November 1994 as the second phase of the Sacramento Municipal Utility District's (SMUD) Proctor and Gamble Cogeneration project in Sacramento, this 44-megawatt simple cycle plant is now under construction. The first phase of this 171-megawatt, \$190 million cogeneration project began producing process steam for Proctor and Gamble's soap-related products manufacturing facility and electricity for use by district customers in March 1997. This second phase "peaker" project is operational as of early April 2001.

Power Plants Presently Under Review

The California Energy Commission is presently reviewing nine major electricity generation projects.

Before a potential power plant of over 50 megawatts can be approved, it must undergo a review to ensure that the project complies with provisions of the War-

Status of California power plant projects

ren-Alquist Act and the California Environmental Quality Act. Issues examined during the year-long proceeding include public health and safety, air and water quality, hazardous materials, environmental impacts, land use, and engineering design.

The siting process breaks roughly into four parts. Once the Energy Commission decides an application is detailed enough to begin study, the staff conducts discovery and analysis before drafting a Preliminary Staff Assessment of the project. Concerns highlighted by this document are then explored in a series of staff workshops in which other agencies, the applicant and the general public can present information. The staff then prepares a Final Staff Assessment, which is typically published about six months into the siting process.

Once the Final Staff Assessment is completed, an Energy Commission Siting Committee takes responsibility for all hearings and related proceedings on the proposed facility. Again, the Energy Commission seeks active public participation. Based on the evidentiary record and public comment, the Committee prepares a Presiding Member's Proposed Decision. Only after additional hearings and public conferences on this document does the Committee formulate its final recommendations. These are considered by the full Commission, which must vote to approve or reject the application at an Energy Commission Business Meeting.

Additional power plant proposals presently being reviewed by the Energy Commission include the following projects, listed with the cities or counties in which they are planned, their anticipated size and cost.

Contra Costa Power Plant — a \$300 million, 530-megawatt natural gas-fired, combined cycle facility to be located within the existing Contra Costa Power Plant complex in Contra Costa County, near the City of Antioch.

East Altamont Energy Center — a 1,100 megawatt natural gas-fired facility proposed for Alameda County by Calpine. (More information will be added in April 2001.)

El Segundo Power Redevelopment Project — a \$350 - \$400 million, 630-megawatt project to expand an existing onsite gas-fired steam plant by replacing two 1950s vintage steam generation units with two combustion turbines and one steam turbine. The new additions consist of combined cycle electric generating facility on the property of the El Segundo Generating Station in El Segundo, Los Angeles County. The 32.8-acre site is located southwest of Los Angeles International Airport adjacent to Santa Monica Bay.

Status of California power plant projects

Huntington Beach Power Station — a \$130 million, 450-megawatt AES proposal to retool and operate at the Huntington Beach Power Station which it purchased from Southern California Edison in 1998. The facility is located in the City of Huntington Beach, Orange County. The proposed project will be a natural gas-fired boiler retooling at the existing generating station. The 12-acre site is located at the intersection of Newland Street and the Pacific Coast Highway, about 600 feet east of the Pacific Ocean.

Metcalf Energy Center — a \$300 million, 600-megawatt power plant proposed for a site one-half mile west of the Pacific Gas and Electric Company's Metcalf substation, south of San Jose in Santa Clara County.

Morro Bay Power Plant Project — a \$650 million proposal by Duke Energy to modernize its existing 1030-megawatt facility in the City of Morro Bay, San Luis Obispo County, and to increase its output by an additional 198 megawatts. The project would replace the currently operating Units 1 and 2, which use 1950's technology, and Units 3 and 4, with 1960's technology, with two new, smaller and more efficient state-of-the-art 600-megawatt combined cycle units. Upon completion, the plant will be capable of producing a total of 1,200 megawatts.

Nueva Azalea Power Plant Project — suspended by the applicant on March 7, 2001.

Otay Mesa Power Project — a \$300 million, 510-megawatt generating project proposed for construction on an undeveloped 15-acre site in western San Diego County. The location is approximately 1.5 miles north of the border between Mexico and the U.S.

Pastoria Energy Facility Expansion Project — A \$250 million 250 megawatt expansion to the Pastoria Energy Facility approved by the Commission on December 20, 2000. Both projects are on the Tejon Ranch in Kern County.

Potrero Power Plant Project — a \$260-\$350 million, 540-megawatt natural gas-fired, combined cycle power generating facility proposed for operation adjacent to the existing 360-megawatt Potrero Power Plant in the city and county of San Francisco. If approved, this project is expected to be operational by the summer of 2003.

Rio Linda / Elverta Power Plant Project — is a 560 megawatt facility in the Rio Linda / Elverta area of Sacramento County. The facility is proposed to

Status of California power plant projects

be built on the site of the Sacramento Ethanol and Power Cogeneration Project. SEPCO was a 148 MW natural gas-fired combined cycle power plant and a rice-straw-to-ethanol facility. The original project was approved by the Commission May 24, 1994, but the facility was never built. On April 6, 2000, the Commission ordered termination of the original certification. The facility is proposed to be built in Rio-Linda, Sacramento County, about seven miles east of the Sacramento International Airport.

Three Mountain Power Project — a \$300 million, 500-megawatt, natural gas-fired, combined cycle power plant that would be located approximately one mile northeast of Burney and 45 miles east of Redding, in Shasta County.

United Golden Gate Power Project — a \$300 million, 570-megawatt, natural gas-fired, combined cycle power plant that would be located near the San Francisco International Airport in San Mateo County.

Small Power Plant Exemptions

Power plants that will generate up to 100-megawatts may be exempt from the 12-month power plant site certification process. The exemption process typically takes six months and involves an environmental review by the Commission.

Approval is granted if the Commission finds that no substantial adverse impact on the environment will result from the construction or operation of the proposed facility. The proposed project must comply, however, with requirements of other permitting agencies.

Hanford Energy Park Project — a \$70 million, 99-megawatt natural gas-fired, combined cycle electric generating facility that would be located on a 10-acre site in the Kings Industrial Park on the southern border of the City of Hanford in Kings County. The site is immediately adjacent to an existing cogeneration plant owned by the applicant.

Energy demand and California population growth

The California Energy Commission produces a yearly forecast of long-term electricity demand. Here are the projections the Commission made each year from 1988 to 1996 of what they expected the peak demand in California to be in 2000.

1988	they projected 2000 peak demand to be	56,673 Megawatts
1990	" " " "	58,873 Megawatts
1992	" " " "	58,684 Megawatts
1994	" " " "	55,819 Megawatts
1996	" " " "	55,422 Megawatts

Actual peak demand in the summer of 2000 was 53,500 Megawatts

Population growth and yearly energy consumption growth was greater in other Western states than in California during 1990s

<u>State</u>	<u>% of population growth 1990-2000</u>	<u>% of yearly energy consumption growth 1988-1998</u>
Washington	21.1	0.7
California	13.8	1.2
Oregon	20.4	1.4
Idaho	28.5	2.2
New Mexico	20.1	3.6
Utah	29.6	3.6
Arizona	40.0	3.7
Nevada	66.3	6.2

¹ Chapter 915, Statutes of 1976

² Hearings of the California Assembly Subcommittee on Electrical Oversight, Feb. 7-9, 2001

GENERATION

Generation

Governor Gray Davis is meeting the challenge of rate stabilization by working to: reduce the wholesale cost of electricity, keep consumer rates at a reasonable level, and maintain the solvency of the investor-owned utilities.

A reliable supply of electricity is the lifeblood of California's prosperity. Unfortunately, deregulation has left a critical imbalance between energy supply and demand.

For the 12 years before Governor Davis took office, the state failed to build a single major power plant. During that time, the state economy grew by 93 percent and California's population grew by six million.

Since April 1999, the Davis Administration has licensed 16 new major power plants. Ten are under construction. Four plants will be up and running this summer. In addition, the Davis Administration has licensed 10 "peaker" plants.

At no other time in the history of California have so many major power plants been under construction.

Governor Davis has cut approval times in half and created an emergency 21-day licensing process for "peaker" plants. Today, power plants are moving through the licensing process and getting built at the fastest rate the state has ever known.

Under Governor Davis' emergency powers and proposals, California will streamline efforts to bring an additional 4,000 MW online by summer 2001 and 20,000 MW online by summer 2004.

Throughout the process, the Davis Administration is ensuring that all generation measures are maintaining California's commitment to clean air and the environment.

The legislative package that Governor Davis has announced will provide incentives to power up more renewable energy, distributed generation and co-generation.

Governor Davis has signed a number of Executive Orders to expedite the permitting of new power plants. The Executive Orders:

- Allow emergency peaking facilities to be permitted in 21 days
- Establish Power Plant Construction Performance Awards
- Shorten local review period for siting new power plants to 7 days
- Expedite permitting to maximize generating output at existing facilities
- Allow gas-fired plants to operate at maximum levels
- Require regional air and water agencies to modify permits to allow maximum generation from existing power plants
- Expedite amendments from simple cycle to combined cycle power plants to eliminate delay in construction

Governor Davis signed legislation to increase generation through expedited permitting and other incentives:

- Expedite permitting for new baseload plants to 120 days
- Waiver of standby charges for distributed generation
- Incentives for renewable generation through net metering
- Loan guarantees for renewable and distributed generation
- Grants for solar systems
- Permit use of backup generation
- Establishment of a public power authority to build power plants

Since January, the Davis Administration has signed long-term contracts to help keep California from being subjected to the fluctuating spot market.

Governor Davis and his Administration have also:

- Met with representatives of power generators, Qualifying Facilities, and municipal utilities to discuss energy issues.
- Created an acceleration bonus for developers to complete construction on new plants by July 2001.
- Directed State and local agencies to streamline the review and permit process for new baseload facilities that can come on line during peak demand periods in 2002.
- Organized "energy fair" workshops to bring together plant owners, utilities, and state agencies, to discuss permitting options for "peaker" plants.

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- Released a report by the California Energy Commission identifying 32 potential locations for the siting of “peaking” plants.
- Taken steps toward providing low-interest financing for new peaking facilities and the “re-powering” of existing ones.
- Appointed a Clean Energy Green team and Energy Construction Czar to oversee the permitting and construction process.
- Encouraged construction of new renewable energy sources through rebates, commercial loan guarantees, and tax credits toward purchase and installation of renewable energy systems.
- Coordinated power plant maintenance schedules through the Independent System Operator to ensure maximum operating capacity.
- Expedited state review of permits for improvement of natural gas pipelines to increase access to natural gas.

MAJOR ENERGY GENERATION LEGISLATION ENACTED INTO LAW BY GOVERNOR DAVIS:

1999-2000 Legislative Session:

AB 918 (Keeley) – Creates incentives for small solar and wind generating systems through net metering provisions.

AB 970 (Ducheny/Battin) – Established two expedited power plant siting processes: a 4 month process for simple cycle facilities; and a 6 month process for power plants with no significant environmental risk. Also established an expedited air permit process for peaker plants.

AB 2698 (Florez) – Reduced appeal times for the siting of the Pastoria power plant in Kern County (750 megawatt capacity, to begin construction July 2001).

SB 110 (Peace) – Expedited permitting for natural gas-fired powerplants. Required the CEC to review and report on potential improvements to the powerplant siting process.

SB 1298 (Bowen) – Required the California Air Resources Board to adopt a certification program for distributed generation that exempts these projects from local air district permitting requirements.

SB 1345 (Peace) – Created a grant program for purchasers of solar water heating systems, storage for grid-connected solar-electric systems, and for distributed electrical generation systems.

SB 1388 (Peace) – Requires state and local agencies to make recommendations on the siting of power plants within 180 days of submission of a complete application.

2001-2002 Legislative Session:

AB 6X (Dutra) – Enacts a five-year ban on the further divestiture of power plants.

AB 31X (Wright) – Allows major industrial manufacturers, such as steel, cement, and glass manufacturers, to use emergency electrical power generating equipment (primarily diesel) during periods of involuntary power service interruptions if necessary to prevent damage to equipment or to complete the processing of products that would be damaged or destroyed as a result of the interruption.

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SB 6X (Burton) – Creates the California Consumer Power and Conservation Financing Authority, modeled after the successful New York Power Authority, with broad powers to construct, own and operate electric generation and related power facilities.

SB 28X (Sher) – Contains a series of provisions to expedite the siting of new electric generation and natural gas projects in California, including expedited permitting timelines, air emission offsets, and waiver of standby charges for small distributed generation facilities. Enacted into law several initiatives called for in Governor's executive orders. Specifically will expedite the siting of an InterGen 900 megawatt plant in Palm Springs and a major gas storage project in the San Joaquin Valley.

CHART - 300 MEGAWATTS OR LARGER
POWER PLANT PROJECTS RECENTLY APPROVED BY ENERGY COMMISSION

As of June 6, 2001
Red indicates on line in 2001.

Project	Applicant/ Host	Size (mega watts)	Project Type	Capital Cost	Location	AFC Filing Date ⁽¹⁾	Date Deemed Date Adequate ⁽²⁾	Date Approved or Denied ⁽³⁾	Construction Start Date And Percent Completed ⁽⁴⁾	Estimated On Line
Blythe Energy (99-AFC-8)	Wisvest	520 MW	Combined Cycle	\$250 million	Blythe, Riverside County	AFC Filed Dec. 9, 1999	March 2000	APPROVED by Commission 3/21/00	May 11, 2001 4%	April 2003
Contra Costa Repower (00-AFC-1)	Southern Energy	530 MW	Combined Cycle	\$200-\$300 million	Antioch, Contra Costa County	AFC Filed Jan. 31, 2000	May 2000	APPROVED by Commission 5/30/01		
Delta Energy Center (98-AFC-3)	Calpine and Bechtel	880 MW	Combined Cycle	\$350-450 million	Pittsburg, Contra Costa County	AFC Filed Dec. 18, 1998	February 1999	APPROVED by Commission 2/9/00	April 2000 40% complete	April 2002
Elk Hills (99-AFC-1)	Sempra/OX Y	500 MW	Combined Cycle	\$300 million	Elk Hills, Kern County	AFC Filed Feb. 24, 1999	June 1999	APPROVED by Commission 12/6/00	May 7, 2001 1%	March 2003 (simple cycle 3/2002)
High Desert (97-AFC-1)	Inland Group and Consolidatio n Energy	720 MW	Combined Cycle	\$350+ million	Victorville, San Bernardino County	AFC Filed June 30, 1997	December 1997	APPROVED by Commission 5/3/00	May 1, 2001 1%	July 2003
Huntington Beach Modernization (00-AFC-13)	AES	450 MW	Combined Cycle	\$130 million	Huntington Beach, Orange County	AFC Filed Dec. 1, 2000	February 7, 2001	APPROVED by Commission 5/10/01	May 1, 2001 1%	August 1, 2001
La Paloma	PG&E	1,048	Combined	\$800	McKittrick	AFC	August 1998	APPROVED	January 2000	12/2001 for

(98-AFC-2)	National Energy Group	MW	Cycle	million	area	Filed	by Commission	65% complete	turbines #1&2 3/2002 for turbines #3&4
Los Medanos Energy Center (Formerly known as Pittsburg District Energy Facility) (98-AFC-1)	Calpine	559 MW	Combined Cycle	\$300 million	Pittsburg, Contra Costa County	AFC Filed June 15, 1998	APPROVED by Commission 8/17/99	July 1999 89% complete	July 2001
(Western) Midway-Suisun (99-AFC-9)	ARCO Western Energy Company	500 MW	Combined Cycle	\$250 million	McKittrick, Kern County	AFC Filed Dec. 22, 1999	APPROVED by Commission 3/21/01	August 2001	March 2003
Mass Landing (99-AFC-4)	Duke Energy	1,060 MW	Combined Cycle	\$475 million	Mass Landing, Monterey County	AFC Filed May 7, 1999	APPROVED By Commission 10/25/00	November 2000 17% complete	June 2002
Mountainview (00-AFC 2)	Thermo Esateck	1,856 MW	Combined Cycle	\$550 million	San Bernardino County	AFC filed Feb. 1, 2000	APPROVED By Commission 3/21/01	September 2001	June 2003
Chay Mesa (99-AFC-5)	PG&E National Energy Group	510 MW	Combined Cycle	\$350 million	Chay Mesa area, San Diego County	AFC Filed August 2, 1999	APPROVED By Commission 4/18/01	July 2001	July 2003
Estofia (99-AFC-7)	Enron	750 MW	Combined Cycle	\$350-450 million	Tejon Ranch, Kern County	AFC Filed Nov. 30, 1999	APPROVED By Commission 12/20/00	July 2001	January 2003
Surprise Power (98-AFC-4)	Texaco Global Gas & Power	320 MW	Simple Cycle (Peaker)	\$200 million	Fellows, Kern County	AFC Filed Dec. 21, 1998	APPROVED by Commission 12/6/00	December 2000 89% complete	August 1, 2001
Sutter Power (97-AFC-2)	Calpine	500 MW	Combined Cycle	\$275 million	Yuba City area, Sutter County	AFC Filed Dec. 15, 1998	APPROVED by Commission	July 1999 97% complete	July 2001

Three Mountain Power (99-AFC-2)	Ogden Pacific Power	500 MW	Combined Cycle	\$300 million	Burney, Shasta County	1997 AFC Filed March 3, 1999	June 1999	APPROVED by Commission 5/16/01	August 15, 2001	January 2004
16 plants	TOTAL MW	10,403 MW	---	---	---	---	---	---	6,557 MW 10 plants	2,353 MW By end 2001 4-1/2 plants

[1] Applicant's filing date of Application For Certification (AFC).
 [2] Date Commission formal process begins following Executive Director recommendation and Commission acceptance of Data Adequacy of the AFC.
 [3] Date Commission issues final decision accepting or denying the application.
 [4] Construction Information Current As of May 25, 2001

CHART - PROJECTS LESS THAN 300 MEGAWATTS
POWER PLANT PROJECTS RECENTLY APPROVED BY ENERGY COMMISSION

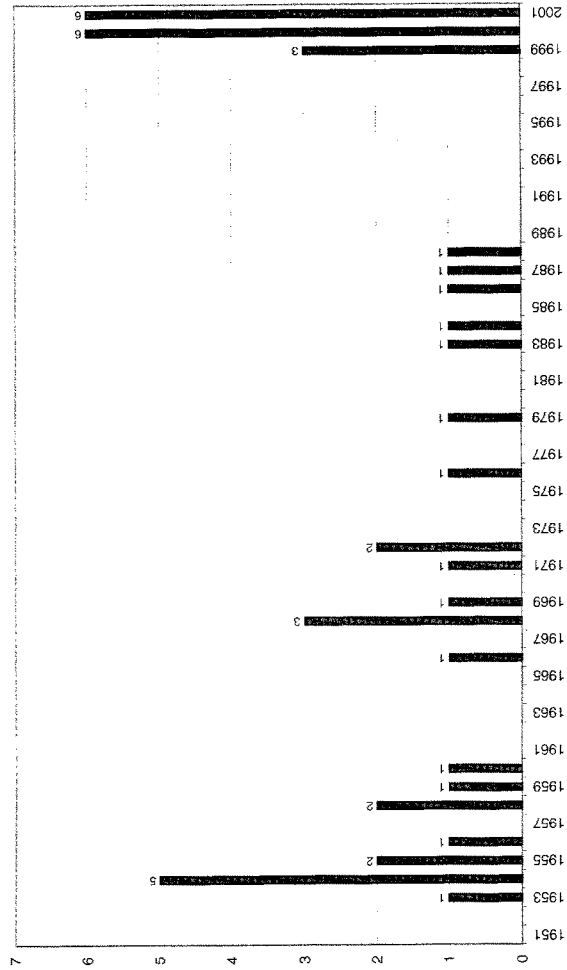
As of June 6, 2001
Red indicates on line in 2001.

Project	Applicant/ Host	Size (mega- watts)	Project Type	Capital Cost	Location	AFC Filing Date (1)	Date Deemed Data Complete (2)	Date Approved or Denied (3)	Percent of Construction Completed	Estimated On Line
Alliance County (01-EP-4)	Alliance Colton LLC	40 MW	Simple Cycle	NA	Colton, San Bernardino County	AFC Filed March 23, 2001	April 5, 01	APPROVED by Commission 4/25/01	10%	August 1, 2001
Alliance County (01-EP-5)	Alliance Colton LLC	40 MW	Simple Cycle	NA	Colton, San Bernardino County	AFC Filed March 23, 2001	April 5, 2001	APPROVED by Commission 4/25/01	35%	August 1, 2001
Calpeak Escandido (01-EP-10)	CalPeak Power LLC	49.5 MW	Simple Cycle	NA	Escandido, San Diego Co.	AFC Filed May 8, 2001	May 16, 2001	APPROVED by Commission 6/6/01	NA	September 30, 2001
Calpine Gilroy (01-EP-8)	Calpine Corporation	135 MW	Simple Cycle	NA	Gilroy, Santa Clara Co.	AFC Filed April 30, 2001	May 1, 2001	APPROVED by Commission 5/21/01	NA	September 30, 2001
Calpine King City (01-EP-6)	Calpine Corporation	50 MW	Simple Cycle	NA	King City, Monterey County	AFC Filed April 5, 2001	April 11, 2001	APPROVED by Commission 5/2/01	1%	September 30, 2001
Hanford Energy Park Peaker (01-EP-6)	GWE Power Systems	95 MW	Simple Cycle	NA	Hanford, Kings County	AFC Filed April 5, 2001	April 11, 2001	APPROVED by Commission 5/10/01	NA	September 1, 2001
Hanford (00-SPPE-1)	GWE Power Systems	99-MW	Combi ned	\$73 million	Hanford, Kings	Small Power Plant Exemption	(Data Completeness	APPROVED by	NA	Withdrawn per applicant letter of

	Company	Cycle	County	(SPPF) Filed May 19, 2000	determination not required for (SPPF)	Commission 4/11/00	4/26/01
Indigo (01-EP-2)	Wildflower Energy LLP	Simple Cycle	NA	AFC Filed March 7, 2001	March 16, 2001	APPROVED by Commission 4/4/01	July 5, 2001
Indigo (01-EP-01)	Wildflower Energy LLP	Simple Cycle	NA	AFC Filed March 7, 2001	March 16, 2001	APPROVED by Commission 4/4/01	July 5, 2001
Pegasus Chino (01-EP-9)	Pegasus Power Partners LLC	Simple Cycle	Chino, San Bernardino Co.	AFC Filed May 8, 2001	May 11, 2001	APPROVED by Commission 6/6/01	September 30, 2001
United Golden Gate (Phase 1) (00-AFC-5)	El Paso Merchant Energy Company	Simple Cycle	San Francisco, San Mateo County	AFC Filed September 29, 2000	March 16, 2001	APPROVED by Commission 3/7/01	Project on hold UNKNOWN DATE ON LINE
TOTAL MW	--	--	--	--	--	--	--
		814.5					
		MW					

[1] Applicant's filing date of Application For Certification (AFC).
 [2] Date Commission formal process begins following Executive Director recommendation and Commission acceptance of Data Completeness of the AFC.
 [3] Date Commission issues final decision accepting or denying the application.
 [4] Construction Information Current As of May 25, 2001

Number of Power Plants Licensed in California
Larger Than 300 MWs



2001 - 2004 Generation Progress Report
(Actual and Current Forecast of MW On-Line By Month)



Note: On-line dates are based on current information and are subject to change. They assume the projects can be permitted and are actually built by developers.

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITY SITING STATUS

6/14/01

Projects Approved Over 300 MW		Status	Capacity (MW)	Project Type	Location	Decision Date	On-line Date*
1	Sutter	Construction	500	Green Field	Sutter Co.	4/99	7/01
2	Los Medanos	Construction	559	Brown Field	Contra Costa	8/99	7/01
3	Sunrise	Construction	320	Green Field	Kern Co.	12/00	8/01
4	Huntington Beach	Construction	450	Repower	Orange Co.	5/01	8/01
	On Line by Summer 01		1,829				
5	La Paloma	Construction	1,048	Green Field	Kern Co.	10/99	12/01-3/02
6	Delta	Construction	880	Brown Field	Contra Costa	2/00	4/02
7	Moss Landing	Construction	1,060	Expansion	Monterey Co.	10/00	8/02
	On Line by Summer 02		2,988				
8	High Desert	Construction	720	Brown Field	San Bernardino	5/00	7/03
9	Elk Hills	Construction	500	Brown Field	Kern Co.	12/00	3/03
10	Blythe	Construction	520	Green Field	Riverside Co.	3/01	3/03
11	Pastoria	Construction	750	Green Field	Kern Co.	12/00	1/03
	Construction Subtotal		7,307				
12	Mountainview	Financing	1,056	Expansion	San Bernardino	3/01	12/02
13	Otay Mesa	Financing	510	Green Field	San Diego Co.	4/01	4/03
14	Three Mountain	Financing	500	Brown Field	Shasta Co.	5/01	5/03
15	Contra Costa	Financing	530	Expansion	Contra Costa	5/01	7/03
16	Midway-Sunset	Financing	500	Expansion	Kern Co.	3/01	6/04
	Subtotal		10,403				
Projects Approved Under 300 MW							
1	Wildflower Larkspur	Construction	90	Green Field	San Diego Co.	4/4/01	7/01
2	Wildflower Indigo	Construction	135	Green Field	Riverside Co.	4/4/01	7/01
3	Alliance Century	Construction	40	Brown Field	San Bernardino	4/25/01	8/01
4	Alliance Drews	Construction	40	Brown Field	San Bernardino	4/25/01	8/01
5	GWf Hanford	Construction	95	Brown Field	Kings Co.	5/10/01	8/01
6	Calpine Gilroy Phase I	Construction	135	Brown Field	Santa Clara Co.	5/21/01	9/01
	Construction Total:		535				
7	Calpine King City	Financing	50	Brown Field	Monterey Co.	5/2/01	9/01
8	Pegasus Energy	Financing	180	Brown Field	San Bernardino Co.	6/6/01	9/01
9	Calpeak Escondido	Financing	49	Brown Field	San Diego Co.	6/6/01	9/01
10	Ramco Chula Vista	Financing	62	Brown Field	San Diego Co.	6/13/01	9/01
11	United Golden Gate	No site control	[51]	Brown Field	San Mateo Co.	3/7/01	
12	Hanford SPPE	Modified	[99]	Green Field	Kings Co.	4/11/01	Modified
	Subtotal		676				
	Approved Total		11,279				
Projects in Review Over 300 MW		Process	Capacity (MW)	Project Type	Location	Decision Date	On-line Date*
1	Metcalf	12-mo. AFC	600	Green Field	Santa Clara Co.	7/01	7/03
2	Ocotillo Peaker	4-mo. AFC	450	Green Field	Riverside Co.	10/01	6/02
3	Potrero	12-mo. AFC	540	Expansion	San Francisco	11/01	11/03
4	Golden Gate	6-mo AFC	570	Brown Field	San Mateo Co.	1/02	11/03
5	Magnolia	6-mo. AFC	310	Expansion	Los Angeles Co.	1/02	11/03
6	Russell City	6-mo. AFC	600	Brown Field	Hayward	1/02	12/03
7	Morro Bay 1/	12-mo. AFC	1,200	Replacement	San Luis Obispo	1/02	1/04
8	ElSegundo Repower 2/	12-mo. AFC	630	Replacement	Los Angeles Co.	2/02	2/04
9	East Altamont	12-mo. AFC	1,100	Green Field	Alameda Co.	3/02	5/04
10	Rio Linda/Elverta	12-mo. AFC	560	Green Field	Sacramento Co.	5/02	5/04
11	Nueva Azalea	12-mo. AFC	[550]	Brown Field	Los Angeles Co.	suspended	suspended
	Subtotal		6,560				

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITY SITING STATUS

6/14/01						
Projects in Review Under 300 MW	Process	Capacity (MW)	Project Type	Location	Decision Date	On-line Date'
1 Baldwin Hills Unit 1	Emergency	53	Brown Field	Los Angeles Co.	6/01	9/01
2 Lancaster La Jolla	Emergency	240	Brown Field	Los Angeles Co.	6/01	9/01
3 Evergreen Concord	Emergency	50	Green Field	Contra Costa	7/01	9/01
4 Calpeak Border	Emergency	49	Green Field	San Diego Co.	7/01	9/01
On Line by Summer 01		392				
5 Valero Cogeneration	4-mo. AFC	102	Brown Field	Solano Co.	9/01	4/02
6 Calpine Gilroy Phase II	4-mo. AFC	135	Expansion	Santa Clara Co.	10/01	3/02
On Line by Summer 02		237				
7 Woodland II	SPPE	80	Brown Field	Stanislaus Co.	9/01	10/03
8 Pastoria II	6-mo. AFC	250	Green Field	Kern Co.	1/02	4/04
Subtotal		959				
Review Total		7,519				
Projects Announced Over 300 MW	Process	Capacity (MW)	Project Type	Location	Filing Date	On-line Date'
1 Blythe Peaker	4-mo. AFC	320	Green Field	Riverside Co.	6/01	5/02
2 Reliant Eliwanda Peaker	6-mo. AFC	400	Brown Field	San Bernardino	6/01	5/02
Total by 9/02		720				
3 Colusa Comb. Cycle	12-mo. AFC	600	Green Field	Colusa County	6/01	7/04
4 Salton Sea Geo.	6-mo. AFC	300	Green Field	Imperial Co.	6/01	12/03
5 Sempra Escondido	6-mo. AFC	500	Green Field	San Diego Co.	7/01	8/04
6 Roseville	12-mo. AFC	750	Green Field	Placer Co.	8/01	8/04
7 Antelope Valley	12-mo. AFC	1,000	Green Field	Kern Co.	8/01	10/04
8 SMUD Comb. Cycle	12-mo. AFC	1,000	Green Field	Sacramento Co.	8/01	10/04
9 South City	12-mo. AFC	550	Green Field	San Mateo Co.	?	
10 Long Beach	12-mo. AFC	500	Green Field	Los Angeles Co.	?	
11 Redondo Beach	12-mo. AFC	1,000	Replacement	Los Angeles Co.	?	
Subtotal		6,920				
Projects Announced Under 300 MW	Process	Capacity (MW)	Project Type	Location	Filing Date	On-line Date'
1 Chino Organic Power	Emergency	160	Brown Field	San Bernardino Co.	6/01	9/01
2 Cenco Refinery Peaker	Emergency	51	Brown Field	Los Angeles Co.	6/01	9/01
On Line by Summer 01		211				
3 Padre Dam La Jolla	4-mo. AFC	50	Brown Field	Los Angeles Co.	6/01	2/02
4 Kern Co. Restart	3-mo. AFC	160	Repower	Kern Co.	6/01	2/02
5 Lancaster Hanover	4-mo. AFC	86	Brown Field	Los Angeles Co.	6/01	3/02
6 City of Santee La Jolla	4-mo. AFC	50	Brown Field	Los Angeles Co.	6/01	3/02
7 Kimberly Clark La Jolla	4-mo. AFC	50	Brown Field	Los Angeles Co.	6/01	3/02
8 Calpine US Dataport	4-mo. AFC	180	Brown Field	Santa Clara Co.	6/01	4/02
9 Spartan Peaker	4-mo. AFC	96	Brown Field	Santa Clara	7/01	5/02
10 City of Vernon	4-mo. AFC	120	Brown Field	Los Angeles Co.	7/01	5/02
11 Carson Expansion	4-mo. AFC	85	Expansion	Los Angeles Co.	7/01	8/02
On Line by Summer 02		877				
12 Occitillo Comb. Cycle	amendment	260	Expansion	Riverside Co.	11/01	12/02
13 Spartan Comb. Cycle	amendment	26	Expansion	Santa Clara	11/01	12/02
14 Sunrise Comb. Cycle	amendment	260	Expansion	Kern Co.	5/01	6/03
15 Blythe Peaker	amendment	200	Expansion	Riverside Co.	11/01	12/02
16 Calpine US Dataport	amendment	70	Brown Field	Santa Clara Co.	11/01	12/02
Subtotal		1,906				
Announced Total		8,826				

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITY SITING STATUS

6/14/01

Projects Planned Over 300 MW	Process	Capacity (MW)	Project Type	Location	Filing Date	On-line Date*
1 Cogeneration	12-mo. AFC	300	Green Field	Kern Co.	7/01	7/04
2 Simple Cycle	4-mo. AFC	450	Brown Field	San Bernardino	7/01	8/02
3 Combined Cycle	12-mo. AFC	1120	Green Field	Alameda Co.	8/01	2/05
4 Combined Cycle	12-mo. AFC	500	Replacement	San Diego Co.	8/01	8/04
5 Combined Cycle	12-mo. AFC	500	Replacement	San Diego Co.	8/01	8/04
6 Combined Cycle	12-mo. AFC	520	Brown Field	Bay Area	1/02	2/05
7 Combined Cycle	12-mo. AFC	375	Green Field	Kern Co.	1/02	3/05
8 Combined Cycle	12-mo. AFC	800	Brown Field	Los Angeles Co.	3/02	5/05
9 Combined Cycle	12-mo. AFC	1000	Replacement	Los Angeles Co.	5/02	7/05
10 Combined Cycle	12-mo. AFC	500	Green Field	Central Valley	6/02	8/05
11 Combined Cycle	12-mo. AFC	500	Replacement	Bay Area	6/02	8/05
12 Combined Cycle	12-mo. AFC	800	Replacement	Sonoma Co.	12/01	12/04
13 Combined Cycle	12-mo. AFC	800	Green Field	Sonoma Co.	12/01	2/05
14 Combined Cycle	12-mo. AFC	600	Green Field	Alameda Co.	12/01	2/05
15 Combined Cycle	12-mo. AFC	600	Green Field	Glenn Co.	12/01	2/05
16 Combined Cycle	12-mo. AFC	600	Green Field	San Joaquin Co.	12/01	2/05
17 Combined Cycle	12-mo. AFC	600	Green Field	Santa Clara Co.	12/01	2/05
18 Combined Cycle	12-mo. AFC	600	Green Field	Merced Co.	12/01	2/05
19 Combined Cycle	12-mo. AFC	300	Green Field	San Joaquin Co.	2/02	4/05
20 Combined Cycle	12-mo. AFC	800	Brown Field	Los Angeles Co.	6/02	8/05
Subtotal		12,065				
Project Planned Under 300 MW						
1 Simple Cycle	4-mo. AFC	100	Brown Field	Fresno Co.	6/01	4/02
2 Simple Cycle	4-mo. AFC	135	Green Field	Santa Cruz Co.	7/01	8/02
3 Simple Cycle	4-mo. AFC	95	Green Field	Kings Co.	7/01	6/02
4 Simple Cycle	4-mo. AFC	162	Green Field	San Joaquin Co.	8/01	7/02
5 Simple Cycle	4-mo. AFC	90	Green Field	Sacramento Co.	8/01	7/02
6 Simple Cycle	4-mo. AFC	90	Green Field	Los Angeles Co.	8/01	7/02
7 Simple Cycle	4-mo. AFC	80	Brown Field	Los Angeles Co.	8/01	9/02
8 Simple Cycle	4-mo. AFC	71	Brown Field	Riverside Co.	8/01	7/02
9 Simple Cycle	4-mo. AFC	200	Brown Field	Kern Co.	6/01	6/02
10 Simple Cycle	4-mo. AFC	200	Brown Field	Yolo Co.	7/01	6/02
11 Simple Cycle	4-mo. AFC	200	Brown Field	Contra Costa Co.	7/01	6/02
12 Simple Cycle	4-mo. AFC	100	Brown Field	Kings Co.	7/01	5/02
13 Simple Cycle	4-mo. AFC	120	Green Field	Kern Co.	6/01	4/02
14 Simple Cycle	4-mo. AFC	170	Brown Field	San Diego Co.	6/01	4/02
15 Simple Cycle	4-mo. AFC	80	Brown Field	Sacramento	6/01	8/01
16 Simple Cycle	4-mo. AFC	150	Green Field	Kern Co.	6/01	4/02
On Line by Summer 02		2,043				
17 Cogeneration	6-mo. AFC	100	Brown Field	San Bernardino	8/01	6/03
18 Combined Cycle	12-mo. AFC	100	Green Field	Merced Co.	6/01	6/04
19 Combined Cycle	12-mo. AFC	100	Green Field	Santa Clara Co.	7/01	7/04
20 Biomass	12-mo. AFC	100	Green Field	Kern Co.	7/01	7/04
21 Combined Cycle	12-mo. AFC	130	Green Field	Kern Co.	5/02	7/05
Subtotal		14,638				
Planned Total		26,703				

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITY SITING STATUS

5/14/01

Notes:

* Estimated on-line date if approved and constructed

Projects in italics are emergency siting projects.

Megawatts in [] are not included in totals.

/1 750 MW will be replaced with 1200 MW for a net increase of 450 MW

/2 350 MW will be replaced with 630 MW for a net increase of 280 MW

Approved	
In Review	
Expected and disclosed	
Expected but undisclosed	

Greenfield - undeveloped site

Brownfield - developed site

Expansion - New unit at existing power plant site, no loss of existing generation

Repower - Modification of existing equipment

Replacement - Demolition of old plant and construction of new plant

CONSERVATION

Conservation

“We have a power shortage but we are far from powerless. We are 34 million strong and if each of us does our part, we can minimize disruptions and get through the summer.”

— Governor Gray Davis

California is already the number one most electricity efficient state in the nation. But there is still room for improvement. In January, Governor Davis called on all Californians to reduce electricity use by 10 percent. Businesses and consumers rose to the task, using 11 percent less electricity during the month of May. That's the energy equivalent of 7 major power plants.

State government has also contributed – cutting consumption by an average of 22 percent from January through April and saving taxpayers over \$530,000.

Governor Davis has signed legislation establishing an \$850 million conservation program – the most sweeping conservation campaign ever undertaken by any state. Governor Davis also used his emergency powers to set up the 20/20 Rebate Program, which will give a 20 percent rebate to users who cut back on their energy use during summer 2001 by 20 percent.

New initiatives in the Governor's energy efficiency campaign include:

- \$50 million for energy-efficient household appliances.
- \$60 million for high efficiency lighting.
- \$35 million for demand responsive systems.
- \$35 million for real-time or time-of-use meters.
- \$50 million in low-interest loans for energy efficiency in schools and local jurisdictions.
- \$90 million for agricultural programs.
- \$50 million for innovative peak load reduction programs.
- \$40 million to increase energy efficiency in state buildings.
- \$240 million for low-income assistance and weatherization programs, to protect those ratepayers least able to pay.
- \$105 million for renewable and other clean distributed generation projects.

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- \$20 million for a paid media campaign coordinated by the Department of Consumer Affairs. State agencies and departments will support this effort with coordinated public outreach.
- \$7 million for school classroom education on energy.
- Partnerships with over 220 cities, counties, and local governments, as well as a host of business organizations including the grocers, the retailers, the Chamber of Commerce and the Silicon Valley Manufacturing Group.
- Announced the signing of a “Declaration of Action” by over 130 business leaders to reduce electricity use by 20 percent.
- An historic partnership between BOMA, SEIU, and other groups to reduce energy at over 3 million square feet of office space.
- A web site to make finding energy rebates easier, www.flexyourpower.ca.gov/rebates.
- An executive order requiring all retail establishments to significantly reduce outdoor lighting during non-business hours.

State Leadership in Energy Conservation and Efficiency

State government is leading by example. State leadership efforts include substantially reducing energy consumption in state buildings; promulgating the strongest energy efficient building standards in the world; utilizing sustainable building designs and operations in state buildings; and using every state department to reach out to its constituencies with powerful conservation messages.

- **State Buildings:** State facilities follow aggressive energy conservation protocols, which include reducing lighting loads, setting interior temperatures at 78 degrees, and reducing the use of non-essential office equipment and appliances. These measures have enabled major state office buildings to reduce their energy consumption by more than 20% when compared with the same month a year ago. Energy efficiency retrofits of hundreds of state facilities also are underway. The goal is to retrofit 100 million square feet of buildings during the next two years.
- **Energy Efficiency Building Standards:** The strongest energy efficiency building standards in the world were developed and approved by the California Energy Commission in record time and formally adopted by the California Building Standards Commission. Among other things, these standards, which went into effect on June 1st, increase the emphasis designers and builders must place on air conditioning and heating ducts, where wasteful leaks often occur, and reduce the amount of solar heat that radiates into a home through windows and the attic. These building standards will save an estimated 200 megawatts a year and up to 1,000 megawatts a year five years from now.
- **Sustainable Building Efforts:** Governor's Executive Order D-16 requires state agencies to design, site, build, and operate buildings that are energy, water, and resource efficient. An interagency Sustainable Building Task Force has developed a comprehensive blueprint for implementing this executive order. One example of this collaborative approach to sustainable building design and construction is the Capitol Area East End project – the largest building project in the history of state government. The energy savings from this \$392 million, five building complex are estimated to be \$400,000 a year. Another example of a sustainable building effort is the Greening of the Capitol initiative. The Legislature, state agencies, the Sacramento Municipal Utility District, and the Rocky Mountain Institute are working together to develop a series of recommendations to ensure that the State Capitol is as energy efficient and sustainable as possible.
- **State Agency Outreach:** Each Cabinet agency is using the thousands of daily contacts with citizens, businesses, and others to spread information about energy conservation and efficiency. State agencies have placed energy conservation messages on state websites, in millions of regular and special communications, lottery tickets, and mailings to professional licensees. These communications include placing conservation messages on 19 million vehicle registration and license renewal notices and in more than one million tax return information notices.

State agencies also have placed articles on energy conservation in trade publications, newsletters, and other professional media, such as the Employment Development Department's *California Employer* newsletter, which reached more than 900,000 subscribers.

Partnerships for Conservation and Efficiency

After setting an example with state entities, the Governor has called upon all Californians to conserve energy and launched a comprehensive campaign. Some of the constituencies who have pledged to conserve include:

- **Business CEOs:** The CEOs of more than 100 major corporations and organizations in California have signed a Declaration of Action and committed to reducing energy use by 20 percent by setting indoor temperatures no lower than 78 degrees, reducing lighting levels by 25 percent immediately, and an additional 25 percent during Stage 2 emergencies, and turning off electrical equipment when not in use.
- **Commercial Building Owners and Janitors:** The commercial sector comprises about 35 percent of California's peak electricity demand. Through a partnership with the Building Owners and Managers Association, building engineers, and the Service Employees International Union, owners of more than 300 million square feet of prime commercial real estate have committed to energy savings of 10 percent or more.
- **Teachers and School Children:** The state developed an energy conservation classroom curriculum and distributed it to all 4th, 5th, and 6th grade teachers in California. The curriculum includes a homework assignment that will walk students and parents through a home energy audit to encourage savings at home. This is the first phase of a longer-term effort to reach students in all grade levels.
- **Conservation Corps:** The California Conservation Corps, local conservation corps, community-based organizations, and volunteers have begun a 17 week campaign during which 1.5 million compact fluorescent light bulbs will be distributed door-to-door in working class neighborhoods throughout California, along with energy conservation and efficiency tips and information. The compact fluorescent light bulbs alone could save 100 megawatts.
- **Local Governments:** Local and county governments and special districts have been joining with state government to encourage up to 15 percent reductions in energy use. Through the efforts of the League of California Cities and the California State Association of Counties, at least 236 cities and 29 counties have adopted formal energy conservation resolutions. The Federal government also has pledged to reduce energy consumption in its facilities in California.

- **Agriculture:** The Department of Food and Agriculture and the Department of Water Resources have developed energy conservation and efficiency strategies and training programs and materials for the agriculture industry. Training sessions were held throughout the state to help the agriculture industry save energy and take advantage of the \$90 million in funding that was made available for related agriculture programs through SB 5x and AB 29x.
- **Appliance Manufacturers and Retailers:** Household appliances like refrigerators, dishwashers, and clothes washers and dryers use significant amounts of energy. The state is working with the manufacturers and retailers of major household appliances to develop incentive programs, point of sale rebates, and joint advertising to encourage the purchase and use of energy efficient appliances.
- **Community-Based Organizations:** Hundreds of community-based organizations are committing to a Declaration of Action that includes reducing energy use by 20% and spreading information on energy conservation and efficiency to their membership and constituencies.

Outreach to California Consumers

To help California consumers save energy and save money, Governor Davis has developed a number of programs, including:

- **Paid Media Campaign:** Using funding made available through SB 5x, the Department of Consumer Affairs is overseeing a \$35 million statewide media campaign to urge energy conservation and efficiency this summer. Through television, radio, and print advertisements in six languages, this campaign is anticipated to reach 95 percent of California's adult and teen population with conservation messages on average 25 times every four weeks. The messages focus on reducing air conditioning and lighting loads and shifting electrical appliance use to non-peak hours. Print and radio ads also support some of the other conservation initiatives, such as the CEO pledges, the 20/20 rebate program, and the energy efficient appliance initiative.
- **California 20/20 Rebate Program:** This voluntary conservation program is open to residential, commercial, and industrial customers. The program will provide rebates to customers who reduce their summer 2001 electricity usage versus last year. Customers will earn a credit worth 20 percent for each month they reduce electricity use by 20 percent or greater. For non-residential customers with time-of-use meters, the 20 percent rebate and reduction apply to the daily peak period, when electricity demand is greatest.
- **More than \$850 million in Funding:** The Governor signed Senate Bill 5x and Assembly Bill 29x, which provided significant funding for energy efficiency, clean generation, and low income assistance programs, including:

- More than \$500 million to save at least 2,000 megawatts through efficiency, demand reduction, and public awareness programs, including:
 - \$50 million for energy-efficient household appliances;
 - \$60 million for high efficiency lighting in commercial buildings;
 - \$35 million to improve demand responsiveness in HVAC and lighting in commercial and industrial buildings; and
 - \$35 million for real time or time-of-use meters.
- \$105 million for renewable and other clean distributed generation projects to help increase electricity supplies.
- \$240 million for low-income assistance, including home weatherization programs, cash assistance, and discounts.

**MAJOR ENERGY EFFICIENCY/CONSERVATION LEGISLATION ENACTED
INTO LAW BY GOVERNOR DAVIS:**

1999-2000 Legislative Session:

AB 970 (Ducheny/Battin) – Appropriated \$50 million to the California Energy Commission for energy efficiency grants. Required the Commission to update energy efficiency standards.

AB 995 (Wright)/SB 1194 (Sher) – Extends for a period of ten years, the surcharge on electricity to fund energy efficiency, renewable technology, and research and development programs.

AB 1551 (Pescetti) – Requires new schools to exceed minimum energy efficiency standards.

SB 1299 (Energy Committee) – Extended revolving loan fund programs used to provide low-interest loans for installation of energy efficiency measures in public schools, local governments, and nonprofit hospitals.

2001-2002 Legislative Session:

AB 29X (Kenoe) – Appropriates \$408 million for a variety of energy conservation and efficiency programs, including installation of real-time meters in all major businesses in California, a state building energy retrofit program, loan guarantees for new technologies, and a mobile efficiency brigade using the California Conservation Corps. Along with the funding provided in SB 5X, these programs were designed to save 5,000 megawatts by summer 2001.

SB 5X (Sher) – Appropriates \$708.9 million for a variety of energy conservation and efficiency programs, including high efficiency lighting systems in commercial buildings, low-energy usage building materials for schools, hospitals, and other nonresidential buildings, demand-responsive building systems, and an agricultural load reduction program. Along with the funding provided in AB 29X, these programs were designed to save 5,000 megawatts by summer 2001.

**SUMMARY OF GOVERNOR'S GENERAL FUND
DEMAND REDUCTION and GENERATION PROPOSALS**

PROGRAMS	Cost	Bill/Author
	(\$ in Mil.)	
DEMAND REDUCTION INITIATIVES:		
State Government:		
DWR financial assistance for water consv.		Pending
CEC staffing	.6	SB 5X (Sher)
Energy Efficiency in State Bldgs.	40	SB 5X
Local and Federal Government:		
Energy efficiency local buildings	50	AB 29X (Kehoe)
Public (Residential):		
AC Incentives/Appliance Rebates	50	SB 5X
Mobil Efficiency Brigade	20	AB 29X
Low-Income Weatherization	20	SB 5X
Public (Business):		
Real-Time/Time-of-use Meters	35	AB 29X
Local Public utility conservation and demand reduction programs	40	SB 5x
Demand Responsive Bldg. Systems	35	SB 5X
White/Reflective Roofs/Cool Communities	30	SB 5X
Innovative Peak Load Reduction Proposals	50	SB 5X
Oil and Gas Pumping Efficiency Projects	12	SB 5X
Commercial Lighting	60	SB 5X
Agriculture Peak Load reduction program	70	SB 5X
Public Outreach:		
Public Awareness Media Campaign	10	SB 5X
Public Awareness Media Campaign	15	Reserve
Classroom Outreach	7	SB 5X
Total (Conservation):	\$544.6	
New Generation Initiatives:		
Rebate: Small Renewable Distributed Gen.	\$15	AB 29X
Tax Credit for Renewable (to be enacted)	7	SB 17X X (Bruitte)
Loan Guarantee for Distributed Generation	40	AB 29X
State Distributed Generation	25	AB 29X
Retrofit existing DG at muni water districts	10	SB 5X
Expedite Local Permitting Process	3	SB 28X (Sher)
Lake County Geothermal Generation proj.	4.5	AB 29X
Total (Generation):	\$104.5	
Other Programs:		
Increase CARE Discount	100	SB 5X
Low-Income Home Energy Assist. (LIHEAP)	120	SB 5X
ARB Emissions Credit Bank	68	Reserve
Construction Bonus Program	20	Reserve
Total OTHER	\$308	
Total of all programs:	\$957.1 Mil.	

Demand Reduction Programs

Current Interruptible Program/CPUC

- Customer contracted on an annual basis to provide specific load reduction upon request in exchange for lower rates.
- When each customer has used 25 events they can opt to go into the new BIP or other demand reduction programs
- Load reductions called for when ISO declares a Stage 2 Emergency

New Base Interruptible Program/CPUC

- Program limited to customers who can commit at least 15% of load, with minimum of 100KW per event.
- Once per day for 4 hours. Ten events per month. 120 hours per year maximum
- Load reduction called for when ISO declares a Stage 2 Emergency

Voluntary Demand Response Program/CPUC

- Volunteer bid program for commercial sector
- Program opened to customers who can curtail at least 15% of load with a minimum drop of 100 KW
- New participants receive an interval meter free of charge if meter is needed
- Customers receiving meter must be in program for one year and bid for at least ten events.

Optional Binding Mandatory Curtailment Program/CPUC

- Load reductions called for in Stage 3 Emergency
- Customers exempt from rotating outages
- Customers must have the ability to reduce load on a circuit by 15% in 5% increments

Air Conditioning and Agricultural Pump Cycling/CPUC

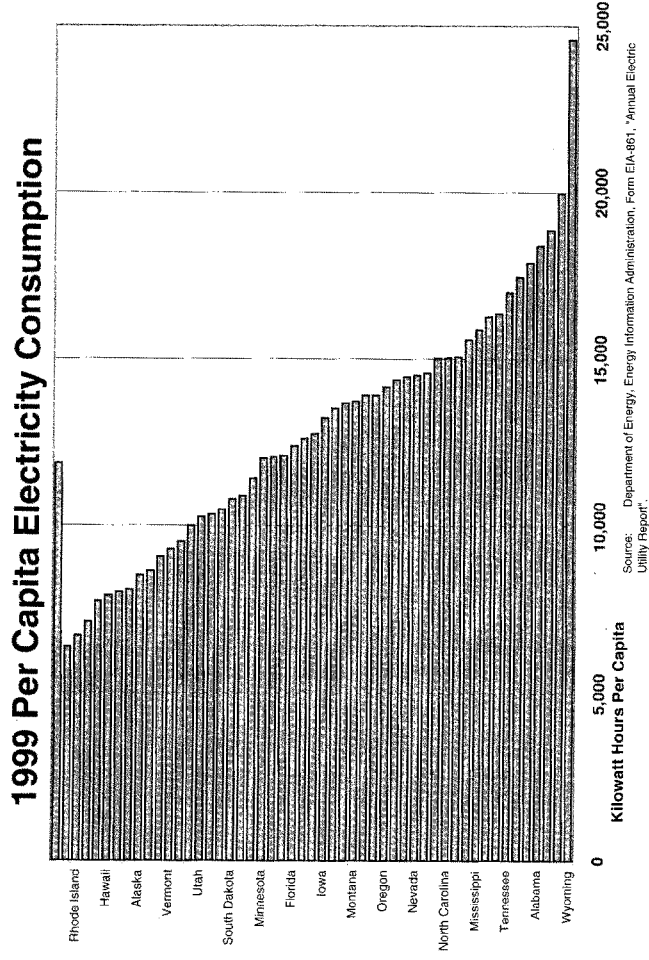
- Applies to customers in Southern California Edison service territory only
- In return for a fixed monthly payment, residential air conditioning equipment has radio controlled device installed for cycling
- Demand reduction program for Agriculture customers and other customers that have water pumping devices have been reopened for new participants

Discretionary Load Curtailment Program/ISO

- Similar to Voluntary Demand Reduction Program
- Open to customers with a minimum aggregated load of 1 MW

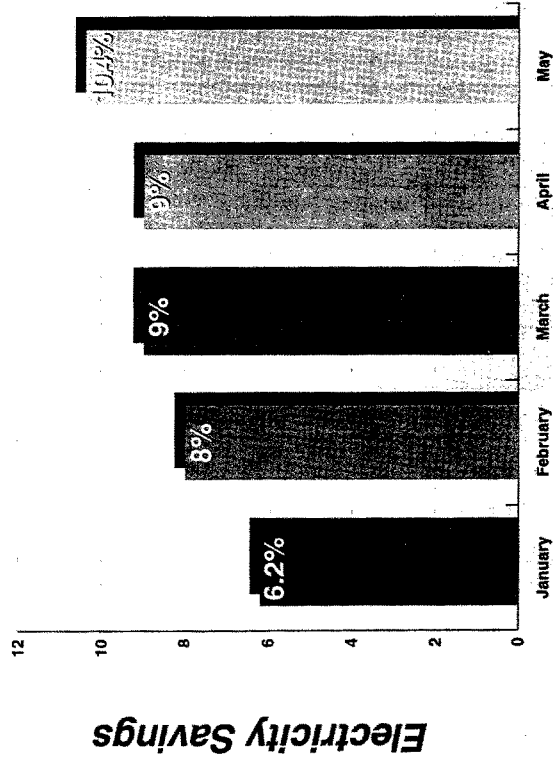
California Demand Bidding Program/ISO

- Program under development
- Customers submit bid price on first come first serve basis, lowest prices accepted by ISO
- Aggregators must have a minimum of 1 MW curtailable load
- Individual loads comprising the bids must be a minimum of 100 KW or greater



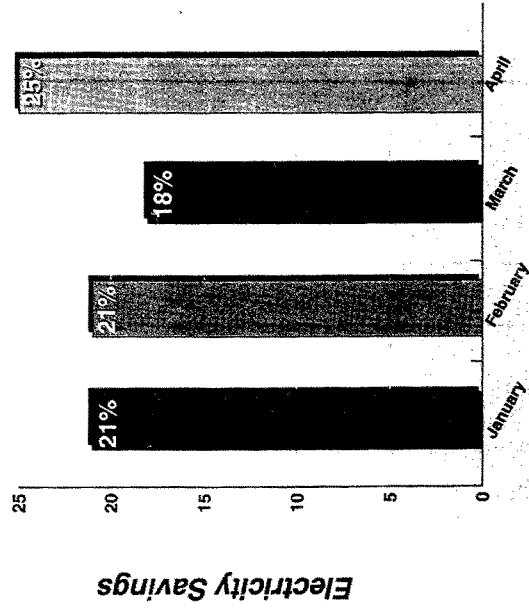
2001

Average Peak Demand Conservation Savings Statewide



Source: California State and Consumer Services Agency

Average Electricity Conservation Savings in State Office Buildings



Source: California State and Consumer Services Agency

STABILIZATION

Stabilization

“Our first priority must be providing reliable, reasonably priced energy to power our homes and businesses.”

— Governor Gray Davis

In April, Governor Davis announced an agreement with Southern California Edison to purchase the company's transmission system in exchange for keeping the utility solvent and viable. The deal will ensure a reliable and affordable supply of electricity for Californians while allowing the state to make necessary upgrades to the transmission lines to improve efficiency.

In addition, Southern California Edison agrees to:

- provide low-cost regulated power to the state for 10 years.
- dismiss lawsuits seeking to significantly drive up electricity rates.
- grant perpetual conservation easements on 20,000 acres of land.
- invest \$3 billion over five years in capital improvements to facilitate efficiency.
- commit the entire output of the Sunrise plant in Kern County to the state for 10 years at cost plus rates, and agree to bring the facility online by August 15, 2001.

In addition, Southern California Edison's parent company, Edison International, will refund no less than \$400 million to SCE.

A similar agreement between the State of California and Sempra Energy was announced on June 18, 2001. The Davis administration is willing to negotiate with Pacific Gas & Electric despite its recent filing for bankruptcy.

Governor Davis has also proposed a plan to raise electric rates fairly which is tied to his plan to stabilize the utilities. For months, Governor Davis resisted efforts to raise consumer and businesses' electric rates. However, due to rising natural gas prices, the Federal Energy Regulatory Commission's failure to enforce reasonable wholesale price controls, and the lack of supply due to failed deregulation, certain balanced rate increases have become necessary to keep the lights on and California's economy strong.

The plan would protect more than half of residential customers from rate increases, assure the state of long-term power, reward those who conserve, and motivate the biggest users to cut back.

Other key rate stabilization initiatives include:

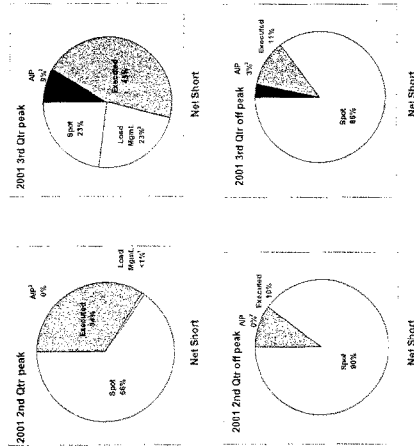
- SB 31X, authorizing the issuance of revenue bonds to fully reimburse the State General Fund for power purchases.
- Assembly Bill 1X, signed by the Governor on February 1, which allowed the state to enter into long-term contracts. Its credit worthiness allows the state to purchase electricity at a better price than the utilities.
- Agreements with generators for 40 long-term, low cost power contracts to supply an average of 8,886 MW per year over the next ten years.
- A 10-year, \$7 billion agreement with Sempra Energy to supply the state with up to 1,900 MW.
- Negotiations to reduce the price of power delivered by co-generation and renewable energy suppliers ("qualifying facilities").
- The seizure of less costly energy contracts from the now-defunct California Power Exchange that otherwise would have been auctioned for higher prices.
- A new law making the Independent System Operator that manages the power grid truly independent, replacing its stakeholder board with independent leadership.
- A new law to prohibit utilities from selling off any more of their power plants that produce low cost power without approval of the state.

DWR has Focused its Purchases for Summer 2001 on Peak Energy Needs - Limiting Exposure to Peak Spot Prices

Figure 8

2001 Typical 2nd Qtr vs 3rd Qtr Monthly Energy Sources to Meet Net Short Energy Requirements¹

(Comparison of On-Peak and Off-Peak, Long-Term Contracts)

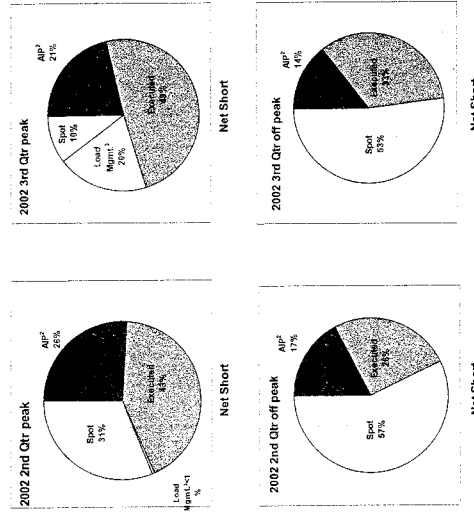


¹ Values are after adjustment for voluntary conservation not included in the programmatic, funded load management programs
² Agreements in Principle
³ Load management is funded conservation programs and paid load curtailment programs

2002 Summer Peak Spot Price Exposure is Less Than 2001

Figure 9

2002 Typical 2nd Qtr vs 3rd Qtr Monthly Energy Sources to Meet Net Short Energy Requirements
(Comparison of On-Peak and Off-Peak, Long-Term Contracts)



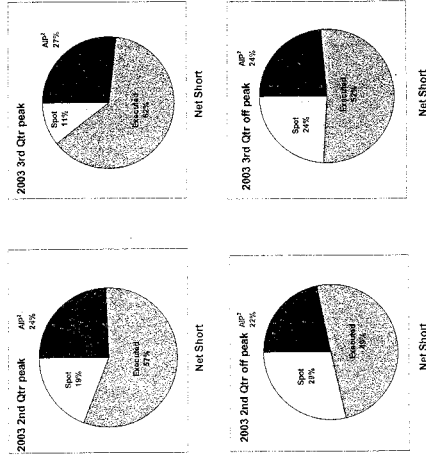
¹Values are after adjustment for voluntary conservation not included in the programmatic, funded load management programs

²Agreements in Principle

³Load management is funded conservation programs and paid load curtailment programs

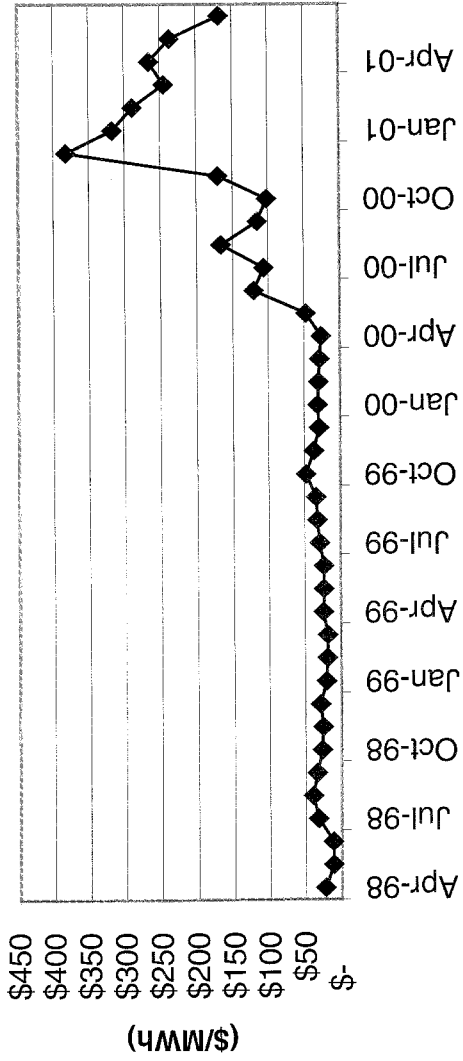
*By 2003, without Load Management Programs,
Spot Market Exposure is Essentially Eliminated*
Figure 10

2003 Typical 2nd Qtr vs 3rd Qtr Monthly Energy Sources to Meet Net Short Energy Requirements
(Comparison of On-Peak and Off-Peak, Long-Term Contracts)



¹ Values are after adjustment for voluntary conservation not included in the programmatic, funded load management programs
² Agreements in Principle

California Wholesale Energy Prices



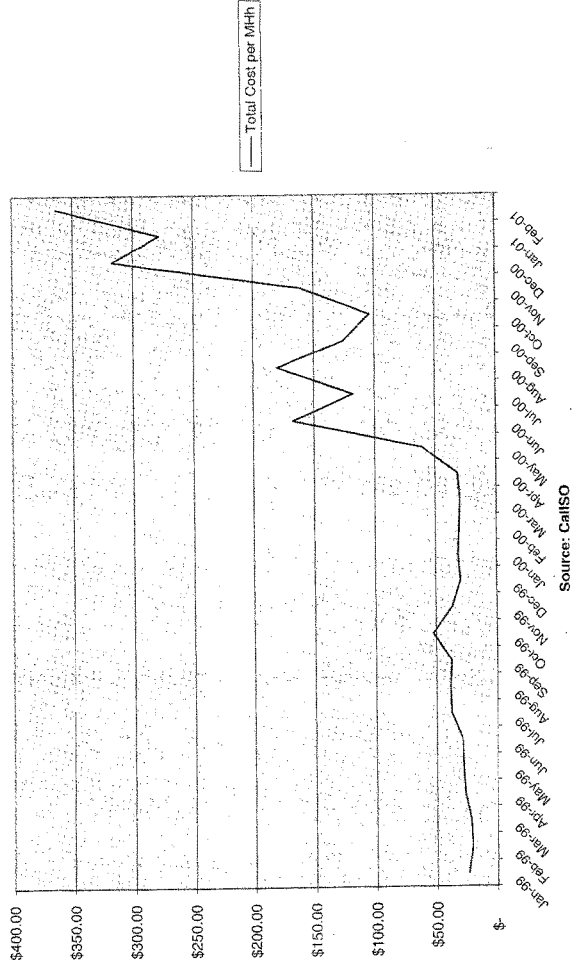
Source: California Department of Water Resources

AVERAGE PRICE, DAY-AHEAD SPOT MARKET, 2001

<u>MONTH</u>	<u>\$/MWH</u>
JANUARY 17-31	\$275
FEBRUARY	\$236
MARCH	\$212
APRIL	\$262
MAY	\$243
JUNE (TO DATE)	\$121

SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES

Wholesale Cost of Electricity in California 1999-2001





**Benefit-Cost Analysis of the Memorandum of Understanding
("MOU") with Southern California Edison ("SCE")**

April 30, 2001 - Update

Prepared By:

The Blackstone Group L.P. – Saber Partners, LLC

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This analysis used and relied on information from public and private sources without having been independently verified. Neither The Blackstone Group nor Saber Partners assume responsibility for the accuracy or the completeness of such information.

Monday, April 30, 2001

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Overview of MOU

A Key Component of a Comprehensive Plan

MOU is Part of a Plan, a Long-Term Solution

- Increasing supply is the only long-term solution
 - ✓ Private sector – stabilize industry and investment environment
 - ✓ Public sector – establish public power authority
- MOU stabilizes Southern California Edison and prepares the company to resume power purchases in 2003 under Public Utility Commission oversight
 - ✓ Stabilizes rates
 - ✓ State can cease power purchases at expiration of ABIX
- Recent FERC ruling requires creditworthy buyer at end of purchasing chain; MOU provides path to SCE solvency and allows State to cease power purchases
- State and SCE will aggressively pursue legal claims against price gouging by merchant generators and marketers
 - ✓ All refunds to go directly to ratepayers/customers
- DEFINITIVE AGREEMENTS will detail implementation of MOU framework
 - ✓ Continued due diligence

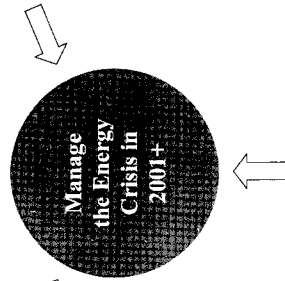
MOU with SCE A Key Component of the Governor's Energy Plan

1. Increase Supply of Power

- Encourage construction of new generation
- Streamline regulatory approval process
- Establish public power authority as builder of last resort

2. Conservation/Demand Side Management

- Pursue aggressive demand reduction programs
- Establish new tiered rate structure to reward and encourage conservation
- Guard against price gouging; push prices down by using market forces



3. Stabilize/Restructure the Electricity Industry

- Negotiate and implement MOU with SCE
- Implement through Definitive Agreements
- Actions required by Legislature and California Public Utilities Commission ("CPUC")
- Structure and sell revenue bonds to amortize power costs
- Purchase transmission assets and upgrade system
- Allow dedicated rate component ("DRC") to repay back debts, restore utility solvency

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Summary of Terms Within the MOU

Summary: MOU Terms

To assure financial recovery, SCE has agreed to the following:

- Continuing regulation and oversight by the CPUC (“reasonableness” and retrospective reviews)
- Provide low-cost power for 10 years (five more than SB6X)
 - ✓ Utility retained generation (regulated) for five additional years until 2011
 - ✓ Sunrise facility (unregulated)
- Dismiss all rate litigation against State including surrendering potential “takings” claim against SB6X – create certainty/settlement
- Sell transmission system for \$2.76 billion (2.3 times book value)
 - ✓ Transfer transmission line revenues (already in rates) to State ownership
 - ✓ Give State right-of-way control over other uses of transmission lines (e.g., telecommunications) not already owned by SCE
 - ✓ Agree to back-up transaction of comparable value (hydro assets and additional low-cost (“cost of service”) power)
 - ✓ Assume certain pre-existing liabilities
- Have terms and pricing of Dedicated Rate Component (“DRC”)-backed bonds approved by State’s Department of Finance

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Summary: MOU Terms (Con't)

- Repay Qualifying Facilities ("QFs") and get them on-line for summer 2001; pursue QF reform
- Grant conservation easements on more than 20,000 acres of land "in perpetuity"
- Invest \$3 billion in regulated infrastructure (money from cash flow from business and new debt, keeping 50:50 debt/equity ratio); Edison International (parent) to make up any shortfalls if retained earnings insufficient
- Sell emission credits relating to previously sold generating stations for the benefit of ratepayers
- Receive from Edison International at least \$400 million in tax refunds; use for general corporate purposes
- Pursue claims against generators; refunds to ratepayers
- Return to being primary power purchaser; cover the net short after 2002 relieving California Department of Water Resources ("DWR") of obligation

Economic Benefits to the State and SCE Customers

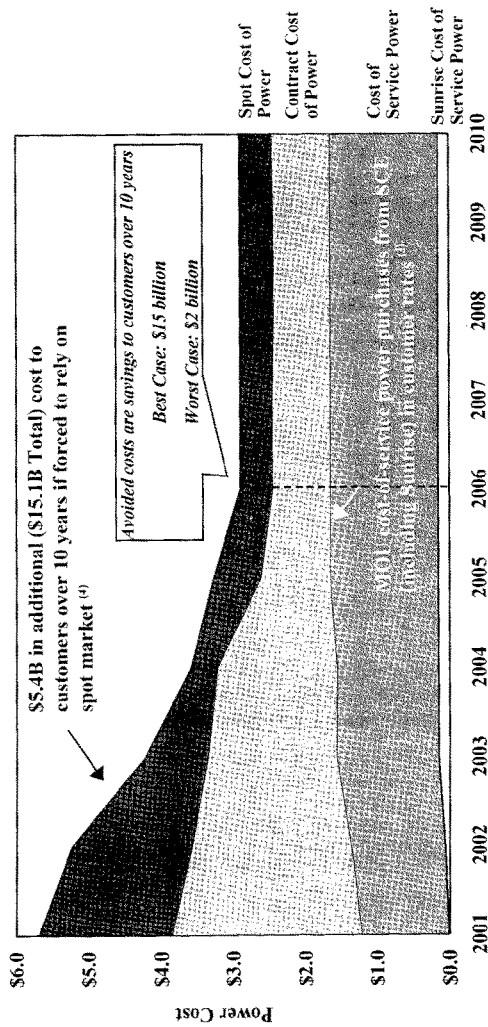
Acquisition of Transmission System is a Significant Value to State and Customers

- Acquisition pays for itself from existing transmission line charges
 - ✓ Income from transmission assets accrues to the State, reducing SCE's earnings
 - ✓ State will use transmission assets and earnings as collateral to finance:
 - \$2.76 billion purchase price
 - 15 years of capital improvements
- Purchase allows for lower cost of financing of system upgrades to improve overall system efficiency
 - ✓ Upgrades increase megawatt hours available to customers through reduced line loss and removal of transmission bottlenecks
 - May increase supply by estimated 800,000 megawatt hours per year
 - Value of Upgrades = \$300 million to ratepayers⁽¹⁾
 - Benefits NOT dependent upon purchase of any other transmission system
 - Gives increased access to Mexico and Arizona
 - ✓ State's lower cost of capital also results in substantial savings to ratepayers
 - Low-cost tax-exempt financing available as primary source of capital for improvements
 - \$500 million in aggregate ratepayer savings on financing⁽²⁾

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Dollar Benefit (NPV) to Customers of SCE Providing Cost-of-Service Power Thru 2010 is \$2-\$15 Billion Over 10 yrs

(\$ in billions)



⁽⁴⁾ First five years of cost of service provided to customers under SB6X is currently subject to potential "takings" claim and litigation by SCE. MODL requires any potential litigation in this regard settled along with other litigation e.g., filed rate doctrine.

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Other Benefits to State with Comments

MOU Term	Benefit
<i>Dismissal of all rate litigation, certainty, settlement</i>	<ul style="list-style-type: none"> ■ If SCE received a favorable ruling, rates could double and would cause economic shock to State economy. Former CA State Supreme Court justice believes SCE's case has substantial merit.
<i>SCE will withdraw challenge of California Procurement Adjustment and DWR bond issuances</i>	<ul style="list-style-type: none"> ■ Allows DWR bond offerings to proceed depending on resolution of PG&E challenge ■ Bond offerings will spread the cost of power purchases over time, minimizing affect on rates ■ Protects consumers from immediate rate shock
<i>SCE to invest \$3 billion over five years in its regulated infrastructure, parent to make up any shortfalls</i>	<ul style="list-style-type: none"> ■ Maintains reliability and efficiency of regulated assets – improves efficiency to lower long-term costs paid by ratepayers ■ Exceeds current SCE capital budget by \$100 million per year; further commits parent to benefit subsidiary
<i>Sale of emission credits</i>	<ul style="list-style-type: none"> ■ Relates to plants previously sold by SCE ■ Proceeds from such sales shall be for the benefit of ratepayers ■ If credits not sold, SCE shall transfer the credits to the State

Other Benefits to State with Comments (Cont'd)

MOU Term	Benefit
<i>Parent to refund tax benefits to SCE</i>	<ul style="list-style-type: none"> ■ Mandates SCE's parent to pay a minimum tax refund of \$400 million; funds to be used within subsidiary
<i>Grant conservation easements to State "in perpetuity"</i>	<ul style="list-style-type: none"> ■ Counties continue to collect property taxes⁽⁶⁾ ■ Substantial benefit of environmental oversight/protection of environment
<i>State gets right-of-way control over other uses of transmission lines</i>	<ul style="list-style-type: none"> ■ Valuable control rights accrue to state <ul style="list-style-type: none"> - SCE has approximately 6,400 circuit miles - \$32 million - \$64 million in value based on value of \$5,000 - \$10,000 per mile

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Strategy for Energy Crisis Management

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Strategy for Energy Crisis Management

- Increase Supply
- Stabilize Rates
- Proposed Rate Structure to Pay for Plan
- Reduce Exposure to Volatile Markets
- Create Win-Win for State, Ratepayers, and SCE

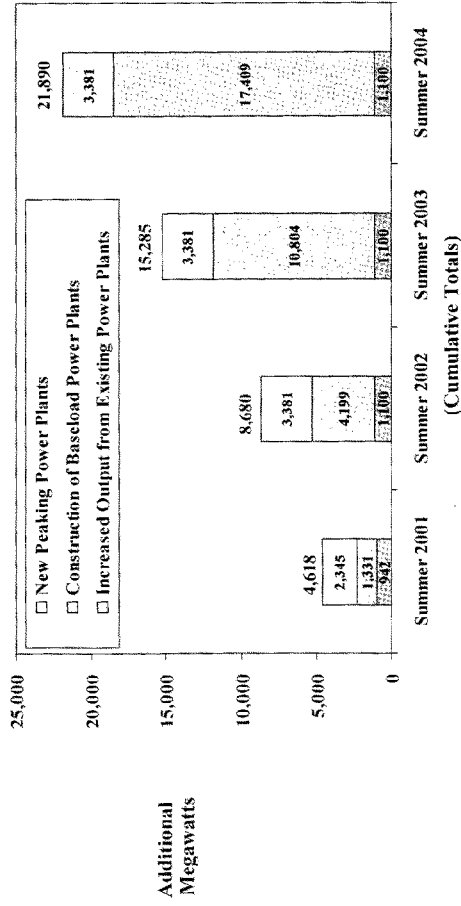
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Monday, April 30, 2001

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**Increase Supply:
Over 20,000 Additional MWs Coming On-Line Thru State Efforts⁽⁶⁾**

Supply shortages are short-term; increased supply will reduce prices and increase reliability for LONG-TERM solution; MOU part of strategy

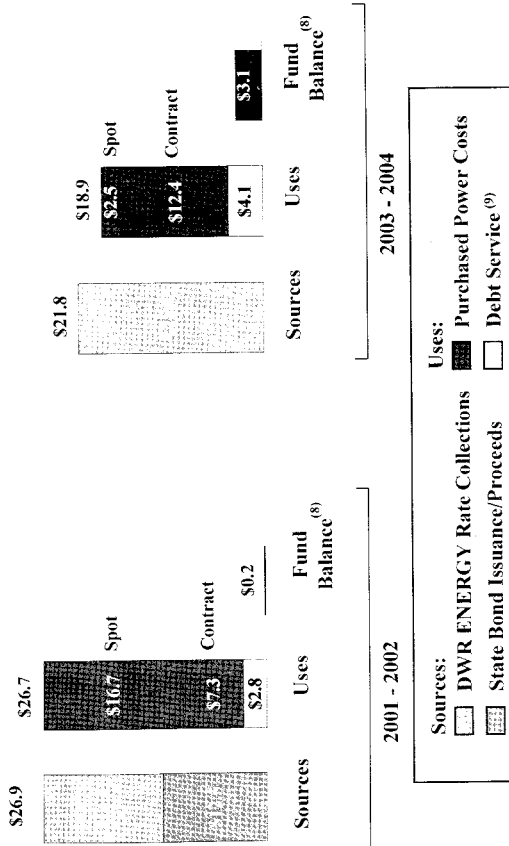


Note: Generation capacities/outputs are adjusted downward for summer conditions.
Monday, April 30, 2001

**Stabilize Rates:
Sources and Uses of DWR Funds 2001-2, 2003-4⁽⁷⁾
For All 3 Utilities**

(\$ in billions)

For All 3 Utilities

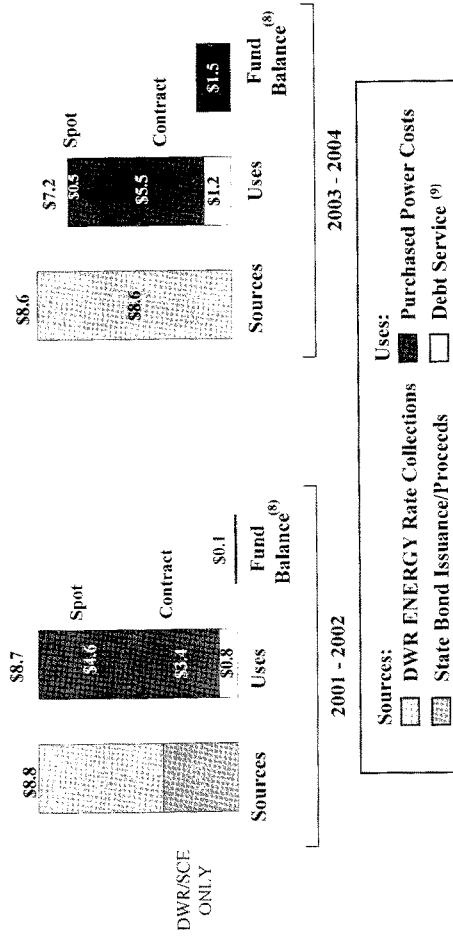


* Approximately \$5.6 billion collected in 2001 and \$8.8 billion collected in 2002 Monday, April 30, 2001

**Stabilize Rates:
Sources and Uses of DWR Funds 2001-2, 2003-4⁽⁷⁾**
For SCE Power Purchases ONLY

(\$ in billions)

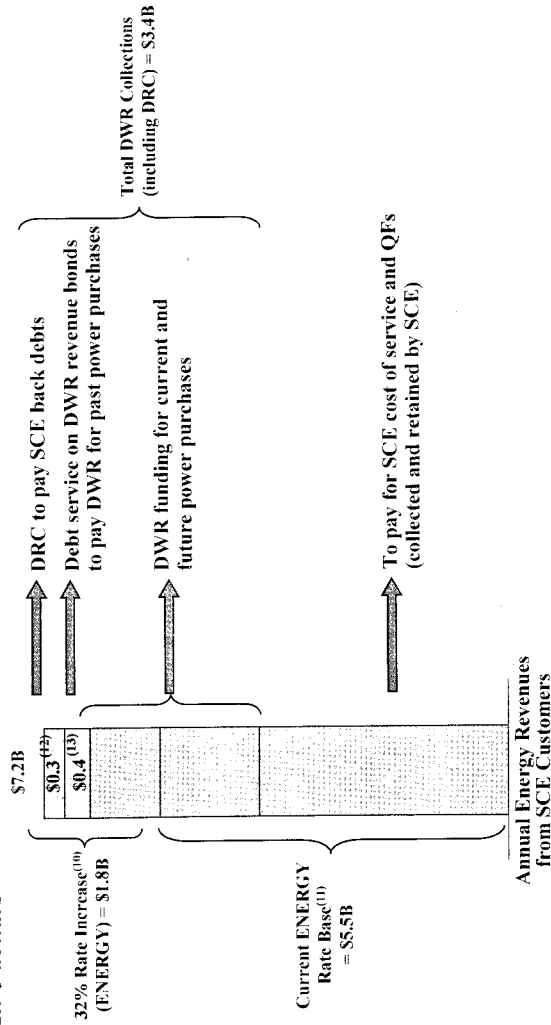
For SCE Only



* Approximately \$2.1 billion collected in 2001 and \$3.4 billion collected in 2002 (see next page for 2002 breakdown)
Monday, April 30, 2001

New Rate Structure Pays for Plan: Breakdown of Energy Charges for SCE Customers in 2002

*Bond offerings to minimize rate shock
In \$ dollars*

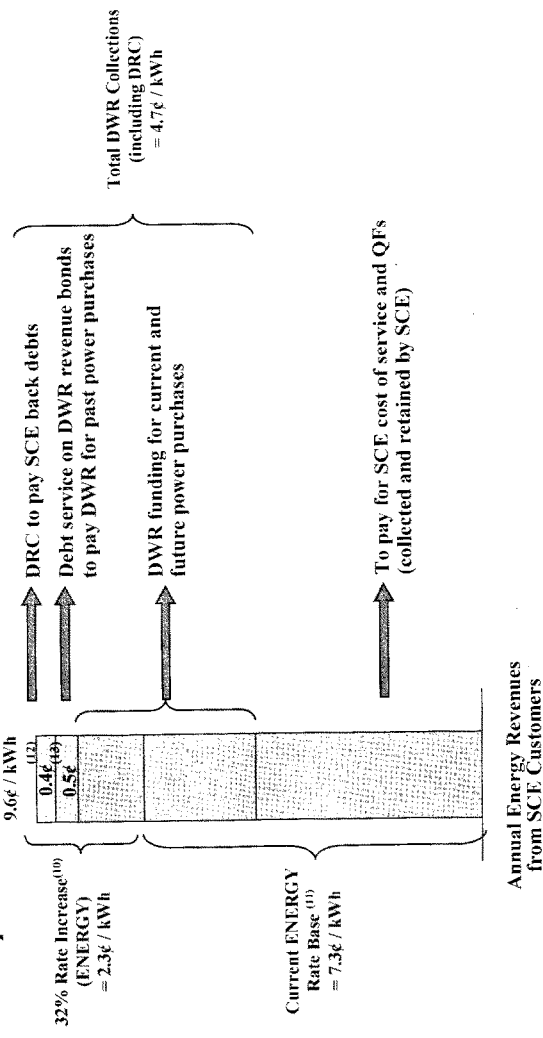


Monday, April 30, 2001

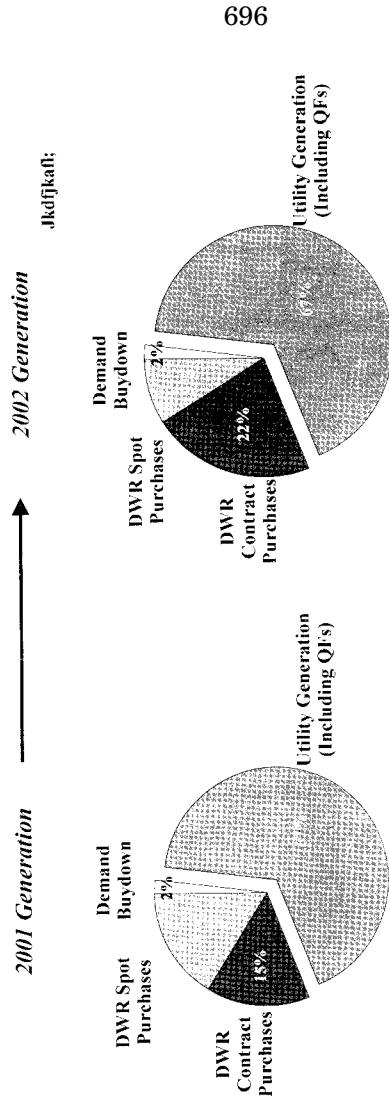
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New Rate Structure Pays for Plan: Breakdown of Energy Charges for SCE Customers in 2002

*Bond offerings to minimize rate shock
In cents per kWh*



Breakdown of Energy Sources for SCE Customers, 2001 - 02⁽¹⁶⁾
Reliance on spot markets shrinks



696

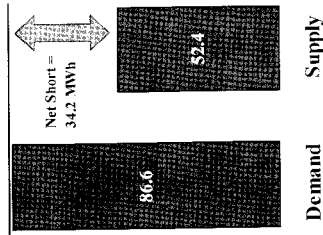
DWR Contract + Spot Purchases + Demand Buydown = "NET SHORT"

Plan Reduces Exposure to Volatile Spot Markets⁽¹⁷⁾

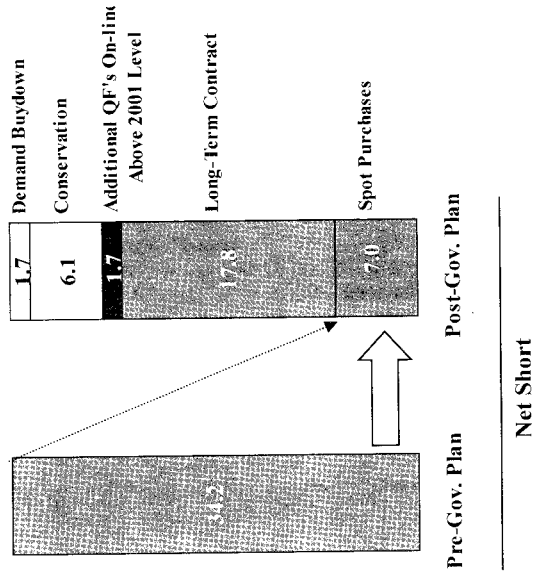
(MWh in millions)

SCE ONLY

How the "Net Short" is Calculated in 2002



How the "Net-Short" is Reduced in 2002



Alternatives Are More Costly

Risk of Bankruptcy Increases if MOU Not Executed:

- Bankruptcy benefits shareholders, not ratepayers
- Extreme measures do not help “keep the lights on” in Summer 2001 nor do they address the net short exposure, repay utility back debts so that utility can resume power purchases in 2003
- Bankruptcy process -- long and complex with diminished state control; uncertain outcome over several years
- Net short exposure may grow in short and long-term, increasing State costs and risk of blackouts

Exercising eminent domain over power plants (seizing them) may have severe negative, and unintended, consequences:

- Authority may not be available to executive branch
- Could undermine investment climate for State within Western region and private sector construction of new generation for long-term crisis solution
- State must pay “fair value” on seized facilities and ALL fees: significantly more expensive than negotiated acquisition of SCE’s transmission system
- May encourage costly litigation; U.S. and California constitutional “takings” issues arise
- Does not address merchant generators and marketers who can still charge exorbitant prices -- if they will still sell

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Conclusion

Recovery Plan is a Win-Win for the State, Ratepayers and SCE

State of California/Ratepayers Get:	Value (\$B)	SCE Gets:	Value (\$B)
<ul style="list-style-type: none"> ■ Transmission system <ul style="list-style-type: none"> ● Savings to ratepayers from State's lower cost of capital ● Upgrades to improve efficiency ■ Right-of-way control over other uses of transmission lines ■ Retained generation at cost through 2010 <ul style="list-style-type: none"> ● 2001 – 2005 ● 2006 – 2010 ■ Dedicating a new non-regulated power plant (Sunrise) at cost for 10 years ■ SCE will drop its lawsuit requesting the repayment of its past debts ■ Emission credits from previously sold plants ■ Environmental easements on 20,000 acres of land ■ State not responsible for net short after 2002 ■ SCE to invest \$3.0 billion in its infrastructure ■ Edison will refund SCE at least \$400 million in inter-company tax payments ■ Other (including block forward contracts) 	<p>\$2.0 – \$2.8⁽¹⁸⁾ 0.3 – 0.5⁽²¹⁾</p> <p>0.3⁽¹⁾ 0.05⁽¹⁹⁾</p> <p>0.0⁽²⁰⁾ – 11.4⁽⁴⁾ 1.8⁽³⁾ – 2.8⁽⁶⁾ 0.6⁽³⁾ – 0.9⁽⁴⁾</p> <p>1.0 – 3.6⁽²³⁾</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>0.0 – 2.0⁽²²⁾</p> <p>\$6.1 – \$24.4</p>	<ul style="list-style-type: none"> ■ \$3.5 billion of back debts related to generation costs already incurred will be repaid: <ul style="list-style-type: none"> ● \$2.7 billion for transmission system (of which \$1.5 billion gain on sale is used to repay back debts) ● Dedicated rate component ("DRC") to repay approximately \$2 billion of back debts ■ Book value of transmission assets ■ Loss of transmission line revenues/income ■ Carrying costs on funds to be received ■ More certain regulatory environment ■ Fixed authorized rate of return⁽²³⁾ 	<p>\$3.5</p> <p>1.2</p> <p>-</p> <p>0.6⁽²³⁾</p> <p>+</p> <p>1/-</p> <p>\$5.3</p>

Low end of range assumes State eventually wins all court challenges

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Other Economic Benefits to the State

- Certainty and stability restored for individual consumers and businesses, thereby reducing the threat of job loss
- State economy remains competitive in regional and global markets for job creation by providing stabilized low-cost, reliable power. Alternatively, massive rate increases and unreliable service would put State at a competitive disadvantage
- Counties still receive tax payments from SCE for local services; no disruption at local level from bankruptcy proceeding as in PG&E
- Private sector investment for new generation supply encouraged with public power authority providing incentives (long-term contracts, subsidies, joint ventures, etc) to build; public power authority will be the builder of last resort of generation plants
- Dramatic reduction of legal risk; settles all outstanding litigation with SCE
- Sets precedent for resolution of PG&E bankruptcy and SDG&E issues

701

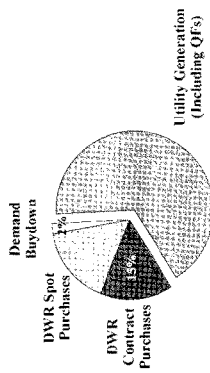
Appendix

Breakdown of Generation/Sources of Power

Breakdown of Sources of Power in 2001 (16)

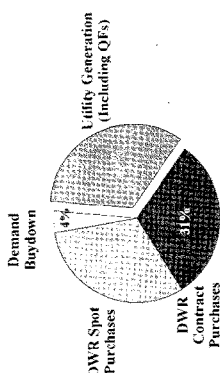
①

*For SCE Customers
Total Consumption = 81 million MWh*



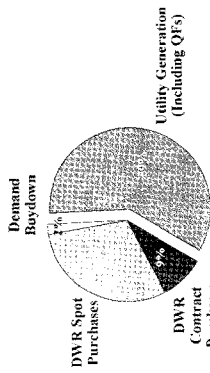
③

*For SDG&E Customers
Total Consumption = 16 million MWh*



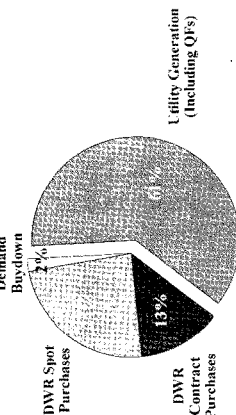
②

*For PG&E Customers
Total Consumption = 91 million MWh*



④

*For all IOU Customers
Total Consumption = 189 million MWh*



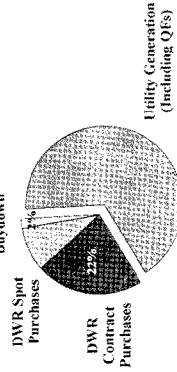
Monday, April 30, 2001

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Breakdown of Sources of Power in 2002(16)

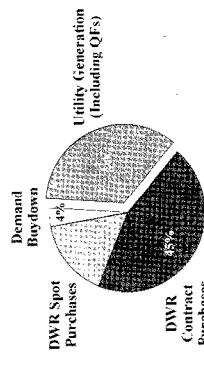
①

For SCE Customers
Total Consumption = 83 million MWh



③

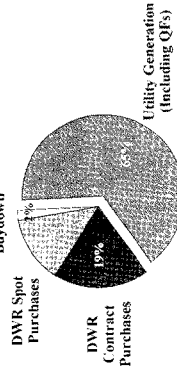
For SDG&E Customers
Total Consumption = 16 million MWh



Monday, April 30, 2001

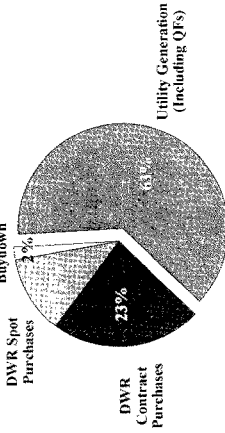
②

For PG&E Customers
Total Consumption = 93 million MWh



④

For all IOU Customers
Total Consumption = 192 million MWh

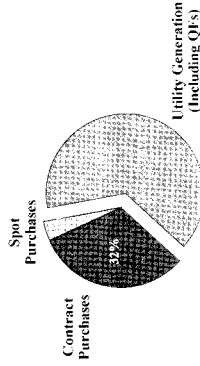


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Breakdown of Sources of Power in 2003(16)

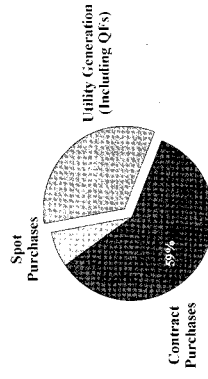
①

*For SCE Customers
Total Consumption = 86 million MWh*



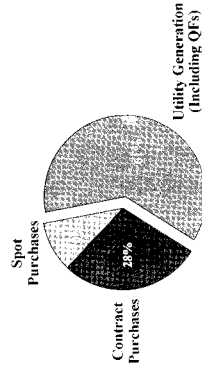
③

*For SDG&E Customers
Total Consumption = 17 million MWh*



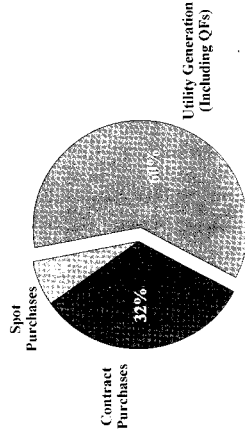
②

*For PG&E Customers
Total Consumption = 95 million MWh*



④

*For all IOU Customers
Total Consumption = 196 million MWh*



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Endnotes

- (1) Assumes line loss factor decreases by 1%, reducing the net short and the amount of power purchased in the spot market.
- (2) Assumes \$180 million of capital improvements per year, an 11.6% return on equity, a 9% cost of debt, a 50%/50% debt/equity ratio, a 25-year depreciation life and a 40% tax rate. State finances with 100% debt at 6% cost of capital.
- (3) Based on contract prices as provided by the DWR and Navigant and plant generation and cost data as provided by SCE. Cost estimates for Sunrise plant based on Goldman Sachs research dated April 10, 2001. Assumes a discount rate of 10%.
- (4) Based on spot prices as provided by the DWR and Navigant and utility generation and cost data as provided by SCE. Assumes a discount rate of 10%.
- (5) As long as SCE continues to have a fee interest.
- (6) Data provided through the Office of the Governor of the State of California.
- (7) Based on utility supply and net short information provided by DWR and Navigant, and selected financing assumptions provided by JP Morgan. Assumes a 32% average increase to the generation portion of SCE's customers' electricity bill.
- (8) Fund balance represents cumulative DWR collections less expenditures. DWR Energy Rate Collections are energy revenues above utility cost of service, which includes the proposed rate increase plus energy revenue from electricity supplied by the DWR.
- (9) Includes DWR bonds and utility securitizations.
- (10) 19% increase to total bill; 32% increase to energy portion of bill.
- (11) Based on utility load information as provided by DWR and Navigant, including effects of conservation and demand buydown program.
- (12) Based on \$3.0 billion of gross securitization proceeds, a 7.25% interest rate and a 15-year final maturity level amortization.
- (13) Based on \$2.1 billion of gross proceeds from a tax-free bond offering, a 5.35% interest rate and a 15-year final maturity; and \$1.2 billion of gross proceeds from a taxable bond offering, a 7.25% interest rate and a 15-year final maturity level amortization.
- (14) Represents DWR funding for current and future power purchases.
- (15) Represents regulated rate prior to increase multiplied by power supplied by SCE (including QFs and bilateral contracts).

Endnotes (Cont'd)

- (16) Based on supply, net short, demand buydown, contract prices, spot prices, QF prices and consumption as provided by DWR and Navigant. 2001 utility generation and consumption data has been annualized (DWR and Navigant provided data starting March 2001).
- (17) Based on data provided by DWR and Navigant. Consumption 86.6 million MWh before effects of Governor's plan. Assumes approximately 80% of QFs are on-line in 2001 and 90% of the QFs are on-line thereafter.
- (18) Range represents value of transmission assets based on precedent transmission transactions (average price-to-book multiple of 1.6x) at the low-end and purchase price (as outlined in MOU) at the high end.
- (19) Range represents right-of-way value of \$5,000 - \$16,000 per mile multiplied by SCE's 10,000 miles of transmission assets as per latest FERC Form 1 filing.
- (20) Based on current regulatory environment. State may already have access to SCE's utility retained generation on a cost-of-service basis through 2005; however, issue is subject to litigation (takings claim) and remains uncertain. The value of SCE's utility retained generation based on DWR contract prices of power in 2001 - 2005 would be \$7.4 billion assuming a 10% discount rate.
- (21) Represents potential additional increase to ratepayer bills as a result of successful litigation.
- (22) Based on sum of (i) block forward contracts which could have been liquidated but the State seized (\$0 - \$500 million); (ii) profits from Incremental Cost Incentive Program ("ICIP") which currently shares profits (revenues less cost-of-service, assumed to be \$43.60/MWh, the current ICIP 2003 price) 50% with rate payers for 2004 - 2010. Under the MOU the full benefit of the ICIP would accrue to the rate payers (\$700 million - \$1.2 billion, assuming a 10% discount rate, spot prices on the high end and contract prices on the low end); and (iii) value of delaying rate case for one year (\$0 - \$300 million).
- (23) Based on the terms of the MOU.
- (24) An "authorized" return is a ceiling on earnings not a floor. SCE may not earn more than this but may earn less. All components still subject to CPUC review to determine calculation of actual earnings.

DEMAND FOR FEDERAL ACTION

I. FERC HAS THE LEGAL RESPONSIBILITY TO ENSURE THAT WHOLESALE ELECTRICITY PRICES ARE JUST AND REASONABLE

- Under FPA § 201(b)(1), the FERC has sole jurisdiction over transmission of electric energy in interstate commerce, and the sale of electric energy at wholesale in interstate commerce.
- Section § 205(a) provides that: *"All rates and charges made, demanded, or received by any public utility for or in connection with the transmission or sale of electric energy subject to the jurisdiction of the Commission, and all rules and regulations affecting or pertaining to such rates or charges **shall be just and reasonable**, and any such rate or charge that is not just and reasonable is hereby declared to be unlawful."*

II. FERC HAS FOUND ELECTRICITY PRICES TO BE UNJUST AND UNREASONABLE IN THE CALIFORNIA WHOLESALE MARKET

November 1, 2000 Order:

- "One of the primary Congressional goals in enacting Part II of the Federal Power Act was to protect electric ratepayers from exercises of market power. Ratepayer interests generally centered on ensuring that rates were not excessive or unduly discriminatory." Slip.Op. at 18
- "The issue raised in this proceeding is whether dysfunctional market rules or the exercise of market power allows prices to rise above just and reasonable levels. We conclude that certain market rules do interfere with the functioning of the market and, taken together, may permit sellers to exercise market power. Accordingly, these market rules must be revised." Slip Op. at 19.

December 15, 2001 Order:

- "We stated that while the record did not support findings of specific exercises of market power in these spot markets, and while we were not able to reach definite conclusions about the actions of individual sellers, there was clear evidence that the California market structure and rules provide the opportunity for sellers to exercise market power when supply is tight and can result in unjust and unreasonable rates under the FPA." Slip Op. 33-34.

- "Moreover, going forward, we have no assurance that rates will not be excessive relative to the benchmarks of producer costs or competitive market prices, due to the circumstances listed above. Therefore, we reaffirm our findings that unjust and unreasonable rates were charged and could continue to be charged unless remedies are implemented." Slip Op. 33-34.

April 26, 2001 Order:

- "In the December 15 Order, the Commission found that the market structures and rules for wholesale sales of electric energy in California were seriously flawed and that these structures and rules, in conjunction with an imbalance of supply and demand in California, have caused, and continue to have the potential to cause, unjust and unreasonable rates for short-term energy under certain conditions." Slip Op. at 2.
- "Some of the power suppliers maintain that no mitigation plan should be adopted, and that the Commission should instead rely solely on market forces. However, the Commission found in the December 15 Order that, because of the flawed market rules and structures in place, there was a potential for the exercise of market power in the California spot market under certain conditions and that a mitigation plan, therefore, was necessary. The Commission will not reconsider that determination here." Slip Op. at 6

CHRONOLOGY OF ACTIONS BY GOVERNOR DAVIS AND THE STATE OF CALIFORNIA TO URGE THE FERC TO FULFILL ITS LEGAL OBLIGATIONS

April 4, 2000 CA Public Utilities Commission (CPUC) filed a complaint against El Paso Natural Gas Co. and affiliates asserting affiliate abuse, exercise of market power, and anti-competitive behavior in violation of the Natural Gas Act.

July 27, 2000 Governor Davis called on federal and state regulators to extend caps on wholesale electricity rates in CA and to provide refunds to San Diego ratepayers.

July 27, 2000 Governor Davis requested coordinated state effort urging federal regulators to take immediate steps to reduce power rates.

August 10, 2000 Governor Davis urged President Clinton to expedite FERC's investigation of electricity rates.

August 29, 2000 CA Electricity Oversight Board (EOB) and CPUC requested FERC impose hard \$250 bid cap for electricity in CAISO markets and \$350 bid cap for electricity in PX markets.

September 12, 2000 Governor Davis issued a statement at San Diego FERC hearing warning that FERC bears the responsibility of ensuring that a competitive market exists before CA consumers are subjected to unconstrained market-based prices.

September 14, 2000 The CA Independent System Operator (CAISO) requested FERC extend wholesale price cap authority giving CAISO discretion as to what the cap would be.

October 19, 2000 The CPUC filed a Motion to impose load-differentiated price cap and mandatory forward contracts and just and reasonable prices.

October 20, 2000 CAISO proposed Offer of Settlement - A price cap of \$100/MWh unless: (1) generator demonstrates price is insufficient to cover costs; (2) generator uses renewable resources; (3) unit is less than 50 MW; (4) new generation; or (5) generator/marketer demonstrates has sold 70 percent of resources under long-term forward contract to in-state load serving entity.

November 9, 2000 Governor Davis submitted videotaped testimony to FERC. Challenged its decision to strip CA of wholesale price cap protection and reminded FERC that it found CA's market to be dysfunctional.

November 22, 2000 CAISO, CPUC, and EOB sought hard price caps through request for rehearing of November 1, 2000 Order.

November 14, 2000 Governor Davis testified before FERC. Called for refunds and hard price and bid caps to protect consumers until marketplace becomes competitive.

December 1, 2000 Governor Davis informed FERC of state initiatives regarding electricity in CA and urged FERC to do its job by rectifying wholesale markets.

December 1, 2000 The CPUC requested FERC provide refunds to San Diego ratepayers.

December 8, 2000 Governor Davis reacted to FERC's sudden lifting of wholesale price caps, calling it "an outrageous assault on the consumers and businesses of California by a federal agency answerable to no one..." CAISO had sought the ruling without the authorization of its Board.

December 13, 2000 Governor Davis convened a meeting with Senator Feinstein, Energy Secretary Richardson, and FERC Chairman Hoecker to request wholesale price caps.

December 15, 2000 Governor Davis called FERC's imposition of \$150/MWh soft cap on wholesale electricity an abdication of its responsibility to the people in the West.

January 2, 2001 Governor Davis announced intention to file friend of the court brief supporting Southern California Edison's lawsuit against FERC, charging failure to protect ratepayers from rates charged by generators.

January 12, 2001 Governor Davis met with Washington Governor Locke and Oregon Governor Kitzhaber to plan joint action on soaring energy prices. Issued a joint statement calling on FERC to reassert cost-based prices in the western market.

January 16, 2001 CAISO, CPUC, and EOB requested rehearing of December 15, 2000 Order.

January 19, 2001 Governor Davis asked Attorney General Lockyer to file motion with FERC to withdraw its order allowing PG&E to restructure and shield its parent company's profits from the utility's debts.

February 5, 2001 CPUC commented on FERC technical conference on market monitoring and mitigation, asking for mandatory forward contracts, just and reasonable prices, and reporting of bid data to state officials.

February 5, 2001 CPUC requested further extension of waiver of QF operating and efficiency restrictions from April 30, 2001 until October 15, 2001.

February 8, 2001 Governor Davis asked FERC to further extend waiver of operating and efficiency restrictions on QFs from April 30, 2001 until October 15, 2001.

February 28, 2001 CPUC and EOB filed a Motion to extend the mitigation measures set forth in the December 15, 2000 Order to California transactions outside the CAISO and PX markets, including transactions by CDWR.

March 1, 2001 CAISO, CPUC, and EOB requested issuance of refund notice, request for data submitted by generators, and request for institution of a hearing, identifying approximately \$550 million in refunds in CAISO markets for period of December 8, 2000 to January 31, 2001.

March 9, 2001 In a letter to FERC, Governors Davis, Locke, and Kitzhaber urged FERC to temporarily cap the cost of wholesale power. The Governors suggested a cost-based price cap that allows generators to recover their costs plus a \$25/MWh profit.

March 20, 2001 CAISO, CPUC, and EOB proposed tariff amendment seeking waiver of underscheduling penalty through June 1, 2001, which was established pursuant to December 15, 2000 Order. The penalty poses a potential liability of approximately \$1 billion to CA IOUs.

March 22, 2001 CAISO, CPUC, and EOB submitted comments on FERC Staff market power monitoring and mitigation proposal and sought imposition of unit-specific cost-based bid caps.

March 15, 2001 Governor Davis sent letter to Senator Murkowski urging Senate Energy and Natural Resources Committee to address high electricity prices and encourage greater levels of intervention by FERC to appropriately address the problem.

March 23, 2001 Governor Davis sent letter to FERC, renewing March 9, 2001 request to take interim steps to restrain unreasonably high wholesale electricity costs.

April 2, 2001 CPUC filed protest of Williams' market power update filing and requested FERC terminate Williams' market rate authority.

April 3, 2001 CPUC intervened in Williams/AES Reliability Must Run contract abuse case, requesting fines equal to treble damages for abuse of market power, and requesting data upon which fines are based.

April 9, 2001 CAISO and CPUC requested rehearing of the March 9, 2000 Order limiting refunds to sales above proxy price in Stage 3 emergencies.

April 10, 2001 Governor Davis sent letter to FERC meeting in Boise, ID outlining CA's efforts and urging FERC to fulfill its legal obligation to assure just and reasonable prices, and impose cost-based wholesale prices at the earliest possible time.

April 19, 2001 Governor Davis met with CA Congressional Delegation to discuss the energy crisis, including the need to reduce wholesale prices of electricity.

April 20, 2001 CAISO, CPUC, and EOB opposed Enron's Motion to reject CAISO filing on grounds that new CAISO Board conflicts with requirements of December 15, 2000 Order.

April 24, 2001 CPUC filed opposition to QFs' request for suspension of their existing contracts and authorization to sell 100 percent of output on market.

April 26, 2001 Governor Davis responded to FERC's April 26, 2000 Order establishing CA market mitigation and monitoring plan. "FERC had a chance to bring meaningful relief to CA's outrageous wholesale prices and they blew it...Last summer, the Federal government found that wholesale prices were unjust and unreasonable. They have yet to enforce their finding."

April 26, 2001 CAISO submitted filing to implement revised bylaws incorporating new Governing Board.

April 30, 2001 CPUC filed Motions to Compel Triennial Market Power Updates by Dynegy and Reliant, which were due in February 2001.

May 3, 2001 Governor Davis sent letter to Congressman Waxman urging House Energy and Air Quality Subcommittee to require FERC to issue refunds for \$6 billion in overcharges from May 2000 to March 2001. Also called on the Subcommittee to insist that FERC impose meaningful cost-plus pricing on a 24-hour basis for all states whose demand exceeds supply for the next 24 months.

May 7, 2001 CAISO, CPUC, and EOB requested rehearing regarding FERC's April 6, 2000 Order which clarified that the CAISO requires a creditworthy buyer for all third-party transactions, including DWR to the extent it buys in hour-ahead CAISO markets (not bilateral contracts).

May 7, 2001 CAISO, CPUC, and EOB commented on Proposed West-wide 206 Investigation and Price Mitigation in Spot Markets Throughout the WSCC, seeking expanded price mitigation in WSCC and prevention of megawatt laundering.

May 10, 2001 Governor Davis responded to the House Energy and Air Quality Subcommittee's disapproval of Congressman Waxman's amendment to impose price caps on wholesale electricity prices.

May 10, 2001 EOB filed opposition to QFs' request for suspension of their existing contracts and authorization to sell 100 percent of output on market.

May 15, 2001 Governor Davis praised Democratic Congressional leadership and House Democrats for proposing a comprehensive national energy plan. Noted the plan's emphasis on immediate federal action, including meaningful wholesale price relief in the west.

May 15, 2001 Governor Davis sent letter to FERC urging the Commission to stay its hand on QF-related matters while CA addresses QF issues.

May 16, 2001 Governor Davis issued statement in response to FERC orders requiring governmental agencies to facilitate and expedite the sale of QF power on the spot market if a court releases QFs from their contracts.

May 17, 2001 In responding to Bush-Cheney energy plan, Governor Davis called on FERC to impose "some form of temporary price relief while we get our plants on-line." Noted that Texas earlier this year adopted price relief that limits the amount energy producers may bid for energy on ancillary and reserved power.

May 23, 2001 Governor Davis issued an invitation to President Bush to meet with him during the President's visit to CA.

May 23, 2001 Governor Davis sent letter to Congressmen Tauzin and Dingell (respectively, Chairman and Ranking Member of the House Energy and Commerce Committee). Governor Davis urged the committee to take meaningful action to mitigate the outlandish costs of wholesale electricity in the west and provide a time-out from the dysfunctional market by immediately imposing temporary price relief.

May 25, 2001 Governor Davis announced a coordinated state legal assault by EOB, PUC, and ISO to force FERC to halt price gouging by energy generators. The filings: (1) requested a rehearing on FERC's April 26, 2001 Order; (2) objected to FERC's proposal to allow surcharges on electricity prices to pay for back debt to generators; and (3) urged immediate revocation of two generators' market-based rate authority.

May 25, 2001 CAISO, CPUC, and EOB commented in opposition to FERC's April 26, 2001 proposal to establish surcharge and escrow account to pay generators for unpaid, past-due bills.

May 25, 2001 CAISO, CPUC, and EOB requested rehearing of April 26, 2001 Order, seeking reimposition of cost-based rates or effective mitigation in all markets in all hours.

May 25, 2001 CAISO, CPUC, and EOB requested revocation of AES' market-based rate authority.

May 25, 2001 CAISO, CPUC, and EOB requested revocation of Williams' market-based rate authority and refunds back to May 1, 2000.

May 29, 2001 Governor Davis released a letter from ten top economists expressing "deep concern" over FERC's failure to enforce provisions of Federal law that require the Commission to set just and reasonable wholesale electricity prices.

May 29, 2001 Governor Davis met with President Bush in Los Angeles to urge temporary wholesale electricity price relief and immediate federal action to stem high CA natural gas prices.

May 30, 2001 CPUC submitted brief on what is considered to be QF excess capacity that can be sold to third parties at market rates.

May 31, 2001 By letters dated May 30, 2001, Governor Davis invited new FERC commissioners Pat Wood and Nora Brownell to CA to brief them on CA's energy situation.

June 1, 2001 CAISO submitted RTO filing.

June 5, 2001 Governor Davis sent letter to Congressman Waxman expressing opposition to an amendment based on H.R. 1974 (Ose, R-CA) that would extend FERC's April 26, 2001 Order throughout the West and to all hours. "The proposed amendment does not substantively change the fundamentally flawed nature of the original Order...trying to dress up the Order and pass it off as the appropriate response to the dysfunctional wholesale electricity market in the West is not the answer to California's problems."

June 7, 2001 CAISO, CPUC, and EOB requested revocation of Mirant's market-based rate authority and refunds back to May 1, 2000.

June 7, 2001 CAISO, CPUC, and EOB requested revocation of Reliant's market-based rate authority and refunds back to May 1, 2000.

June 7, 2001 CAISO, CPUC, and EOB requested revocation of Dynegy's market-based rate authority and refunds back to May 1, 2000.

June 7, 2001 CAISO, CPUC, and EOB requested revocation of Duke's market-based rate authority and refunds back to May 1, 2000.

CALIFORNIA REQUESTS OF FERC AND FERC'S RESPONSES

Party	Date	Request	Response/Status
PUC RP00-241, et al.	Filed 4/4/00 Motion for Summary Disposition filed 8/30/00	Complaint against El Paso Natural Gas Co. and affiliates asserting affiliate abuse, exercise of market power/anti-competitive behavior in violation of Natural Gas Act.	Pending. Hearing set pursuant to March 28, 2001 Order re: El Paso's exercise of market power/anti-competitive behavior only. Order found no affiliate abuse. PUC sought rehearing. June 11, 2000 Order partially granted request for rehearing and expands hearing to examine allegations of affiliate abuse and violations.
GGD PUC	7/27/00 - present	Extend/impose wholesale price/bid caps, and/or reassert cost-based pricing.	Hard cap reduced from \$500 to \$250 in August 2000. On December 7, 2000, the FERC lifted the hard cap in response to the ISO's request. \$150 soft cap was established pursuant to December 15, 2000 Order, effective January 1, 2001. Changed to monthly proxy clearing price mechanism restricted to Stage 3 pursuant to March 9, 2001 Order.
GGD PUC	7/27/00 11/14/00 12/1/00	Provide refunds to San Diego ratepayers.	March 9, 2001 Order established 'rate screen' above which refunds are required or further investigation is undertaken -- identified \$69 million in potential refunds for January 2001.

CALIFORNIA REQUESTS OF FERC AND FERC'S RESPONSES

Party	Date	Request	Response/Status
EOB/PUC EL00-104	8/29/00	Impose hard \$250 bid cap for electricity in ISO markets and \$350 bid cap for electricity in PX markets.	Denied by FERC in December 15, 2000 Order, which established \$150 soft cap. Request for rehearing pending.
ISO ER00-3673	9/14/00	Extend wholesale price cap authority giving ISO discretion as to what the cap would be (e.g., load-differentiated cap).	Rejected by December 15, 2000 Order, which established a \$150 soft cap.
PUC	10/19/00	Motion to impose load-differentiated price cap and mandatory forward contracts and just and reasonable prices.	Rejected by December 15, 2000 Order, which established \$150 soft cap.
ISO EL00-95, et al.	10/20/00	ISO proposed Offer of Settlement - price cap of \$100/MWh unless: (1) owner demonstrates price is insufficient to cover costs, (2) generator uses renewable resources, (3) unit is less than 50 MW, (4) new generation, or (5) owner of marketer demonstrates has sold 70 percent of resources forward to in-state load serving entity under a long-term contract.	Rejected by December 15, 2000 Order, which established a \$150 soft cap.
EOB/ISO/ PUC	11/22/00	Rehearing of November 1, 2000 Order -- Seeking hard price caps.	Hard caps rejected by December 15, 2000 Order. Rehearing requests pending.
EOB/ISO/ PUC	1/16/01	Rehearing of December 15, 2000 Order.	Pending.
PUC	2/5/01	Comments on FERC technical conference on market monitoring and mitigation, asking for mandatory forward contracts, just and reasonable prices, and reporting of bid data to state officials.	Effectively rejected by April 26, 2000 Order.
PUC	2/5/01	Further extension of waiver of QF operating and efficiency restrictions from April 30, 2001 until October 15, 2001.	Approved extension of waiver through December 31, 2001 pursuant to March 14, 2001 Order.

CALIFORNIA REQUESTS OF FERC AND FERC'S RESPONSES

Party	Date	Request	Response/Status
GGD	2/8/01	Further extension of waiver of QF operating and efficiency restrictions from April 30, 2001 until October 15, 2001.	Approved extension of waiver through December 31, 2001 pursuant to March 14, 2001 Order.
EOB/PUC EL00-95, et al.	2/28/01	Motion to extend the mitigation measures set forth in the Dec. 15 Order to California transactions outside the CAISO and PX markets, including transactions by CDWR	Effectively denied by April 26 Order
EOB/ISO/ PUC EL00-95, et al.	3/1/01	Issuance of refund notice, request for data submitted by generators and request for institution of a hearing. Identifies approximately \$550 million in refunds in ISO markets for period of December 8, 2000 to January 31, 2001.	March 9, 2001 Order established just and reasonable 'rate screen' above which refunds are required or further investigation is undertaken -- identified \$69 million in potential refunds for January 2001.
EOB/ISO/ PUC ER01-1579	3/20/01	Tariff amendment seeking waiver of underscheduling penalty through June 1, 2001, which was established pursuant to December 15, 2000 Order. The penalty poses a potential liability of approximately \$1 billion to IOUs.	Denied pending consideration of the issue in response to motion by PG&E and Edison in another docket.
EOB/ISO/ PUC EL00-95, et al.	3/22/01	Comments on FERC Staff market power monitoring and mitigation proposal. Imposition of unit-specific cost-based bid caps.	Rejected in favor of Commission's plan as set forth in April 26, 2001 Order.
PUC	4/2/01	Protest of Williams market power update filing and request to terminate Williams market rate authority.	Pending.
PUC	4/3/01	Intervention in Williams/AES RMR abuse case, requesting fines equal to treble damages for abuse of market power, and requesting data upon which fines are based.	Rejected by FERC Order approving settlement with Williams.
ISO/PUC EL00-95, et al.	4/9/01	Rehearing of the March 9, 2000 Order limiting refunds for sales above a proxy price for stage 3 emergencies only.	Pending.

CALIFORNIA REQUESTS OF FERC AND FERC'S RESPONSES

Party	Date	Request	Response/Status
EOB/ISO/ PUC	4/20/01	Opposition to Enron motion to reject ISO filing on grounds that new ISO Board conflicts with requirements of December 15, 2000 Order.	Pending.
ISO EL00-95, et al.	4/26/01	Filing to implement revised bylaws incorporating new Governing Board.	Pending.
EOB/ISO/ PUC ER01-889	5/7/01	Rehearing regarding FERC's April 6, 2000 Order which clarified that the ISO requires a creditworthy buyer for all third-party transactions, including DWR to the extent they buy in hour-ahead ISO markets (not bilateral contracts).	Pending.
EOB/ISO/ PUC EL00-95, et al.	5/7/01	Comments on Proposed West-wide 206 Investigation and Price Mitigation in Spot Markets Throughout the WSCC - Expanded price mitigation in WSCC and prevention of megawatt laundering.	Pending.
EOB PUC EL-00-95-020 EL-00-98-019	5/10/01 4/24/01	Filed opposition to QFs' request for suspension of their existing contracts and authorization to sell 100% of output on market.	May 16, 2001 Order requires CA utilities to provide transmission and interconnection services to a QF that is released by a court from its long-term contract. However, the Order "does not modify or abrogate existing contracts."
GGD	5/15/01	Stay of action on QF-related matters while CA addresses QF issues.	May 16, 2001 Order requires CA utilities to provide transmission and interconnection services to a QF that is released by a court from its long-term contract. However, the Order "does not modify or abrogate existing contracts."

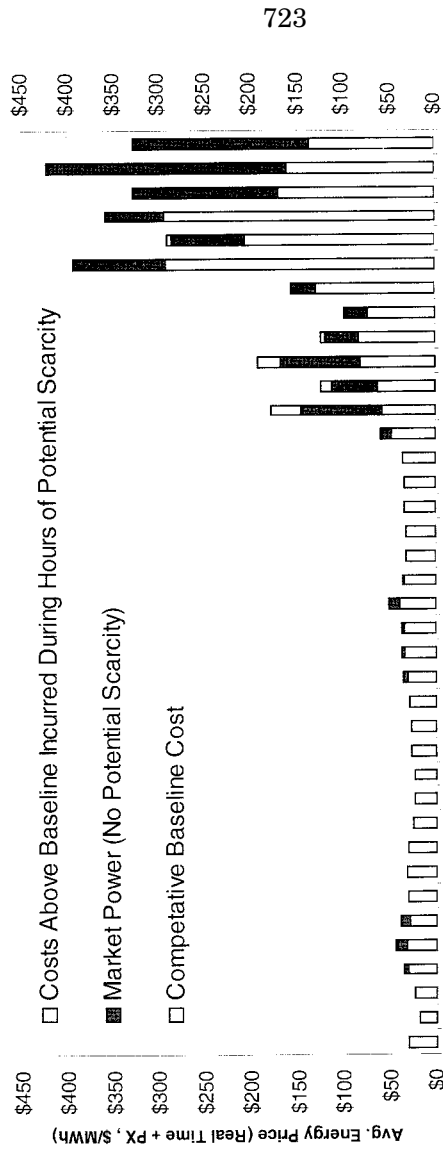
CALIFORNIA REQUESTS OF FERC AND FERC'S RESPONSES

Party	Date	Request	Response/Status
EOB/ISO/ PUC EL00-95, et al.	5/25/01	Comments in opposition to the FERC's April 26, 2001 proposal to establish surcharge and escrow account to pay generators for unpaid debts.	Pending.
ISO/EOB/ PUC EL00-95, et al.	5/25/01	Rehearing of April 26th Order - seeking reimposition of cost-based rates or effective mitigation in all markets in all hours.	Pending.
EOB/ISO/ PUC ER98-2186, ER98-2184, ER98-2185	5/25/01	Revocation of AES' market-based rate authority.	Pending.
EOB/ISO/ PUC ER95-305	5/25/01	Revocation of William's market-based rate authority and refunds back to May 1, 2000.	Pending.
PUC	5/30/01	Brief on what is considered to be QF excess capacity which can be sold to third parties at market rates.	Pending.
ISO RT01-85	6/1/01	RTO filing.	Pending.
EOB/ISO/ PUC ER99-1842, ER99-1833, ER99-1841	6/7/01	Revocation of Mirant's market-based rate authority and refunds back to May 1, 2000.	Pending.
EOB/ISO/ PUC ER98-927, ER98-928, ER98-930, ER98-931, ER98-2878	6/7/01	Revocation of Reliant's market-based rate authority and refunds back to May 1, 2000.	Pending.

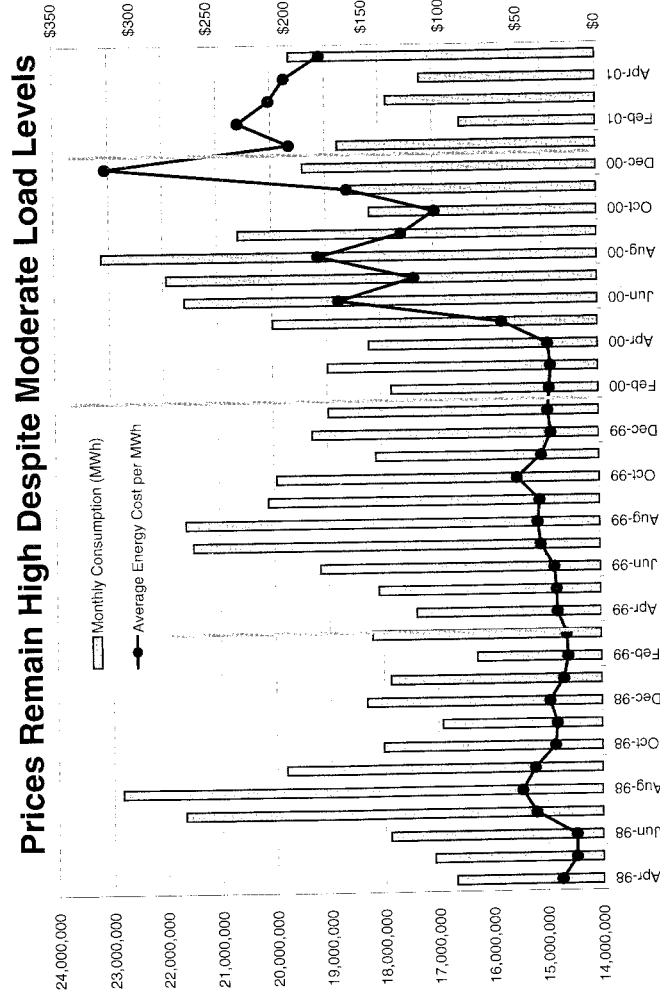
CALIFORNIA REQUESTS OF FERC AND FERC'S RESPONSES

Party	Date	Request	Response/Status
EOB/ISO/ PUC ER98-1127, ER98-1796, ER99-1115, ER99-1116	6/7/01	Revocation of Dynegy's market-based rate authority and refunds back to May 1, 2000.	Pending.
EOB/ISO/ PUC ER98-2680, ER98-2681, ER98-2682, ER99-1785	6/7/01	Revocation of Duke's market-based rate authority and refunds back to May 1, 2000.	Pending.

**Price Markup over Competitive Costs
Highest since June 2000**



Source: Department of Market Analysis California Independent System Operator

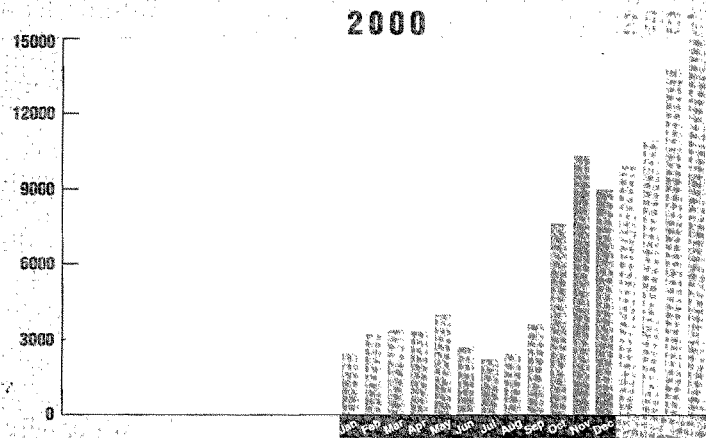


Source: Department of Market Analysis California Independent System Operator

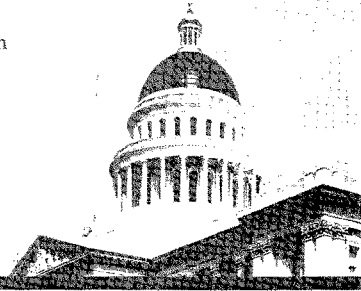
(06) Prices Remain High -- ISO Chart.xls

GOVERNOR GRAY DAVIS

Average Daily Megawatts
Off-Line by Month, 1999-2001

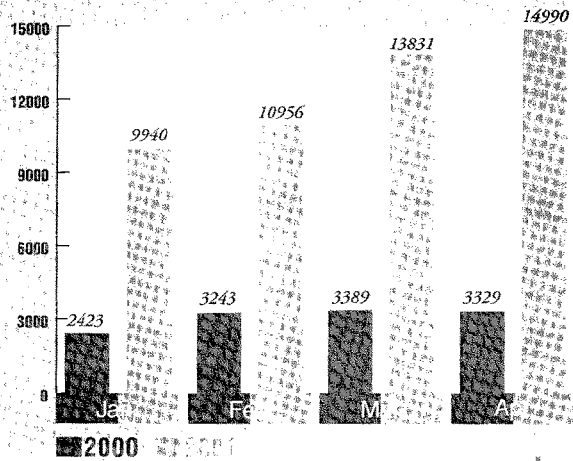


Source: California Energy Commission

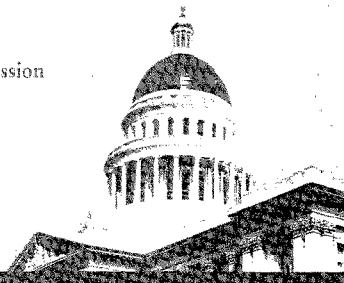


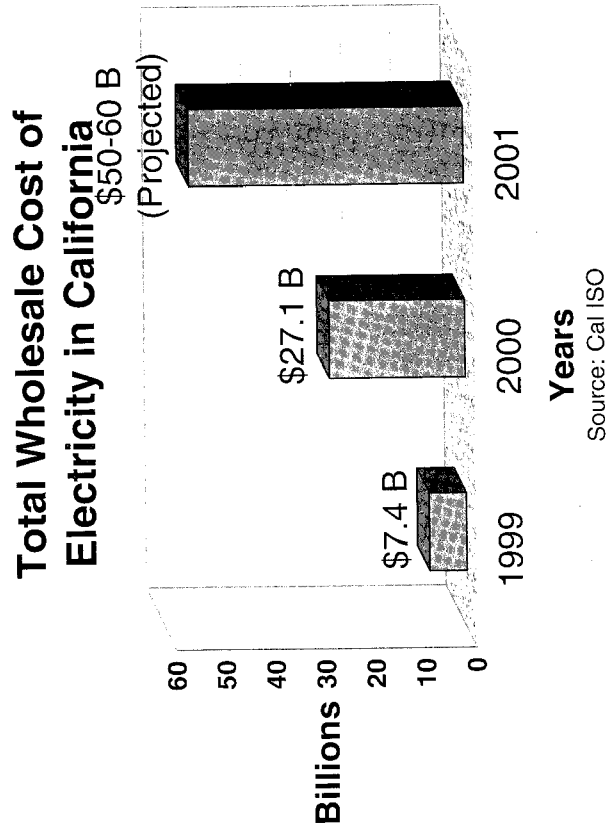
GOVERNOR GRAY DAVIS

Average Daily Megawatts Off-Line by Month, 2000-2001



Source: California Energy Commission

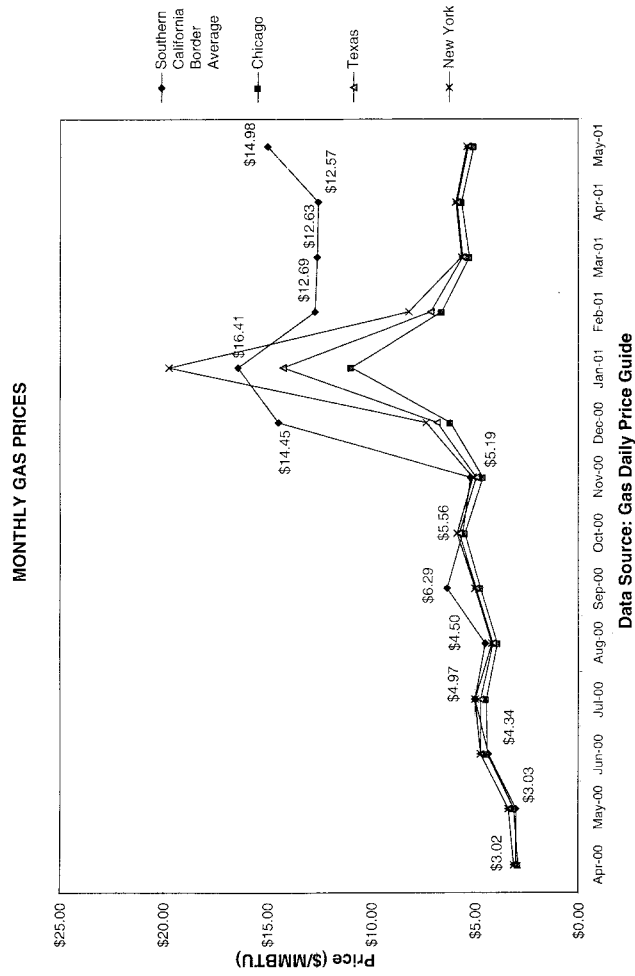




California Has Seen Biggest Natural Gas Price Increases

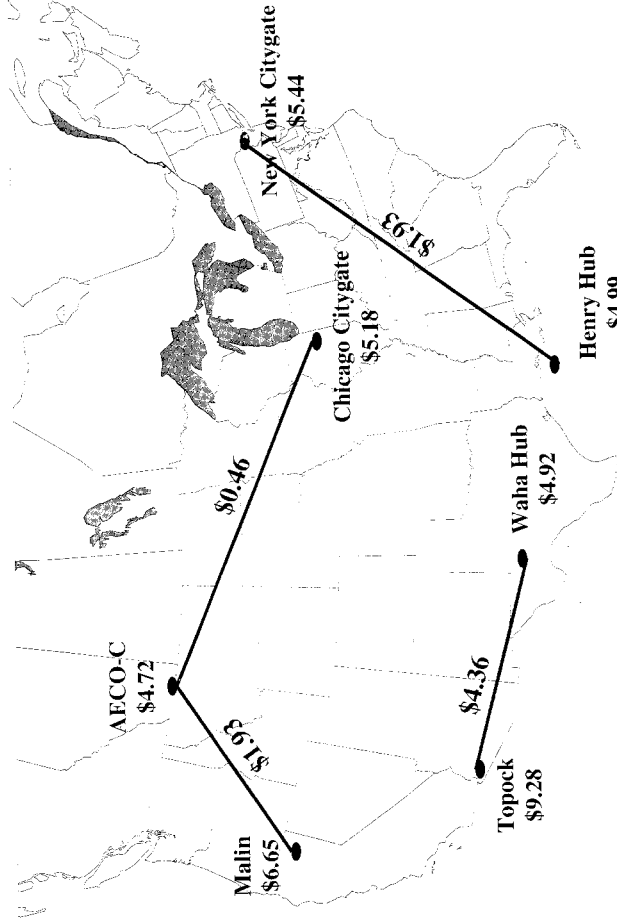
- Until 2000, California gas prices tracked national prices – **current difference is unprecedented**
 - Starting in November 2000, prices to California diverged from national prices -- California now faces prices **two to three times higher** than the national average
 - May 1 Prices
- | | |
|---------------------|---------------|
| Southern California | \$14.98/MMBtu |
| Chicago | 5.03 |
| Texas | 5.30 |
| New York | 5.35 |

Source: Gas Daily Price Guide



Natural Gas Transportation Cost Differentials

March 16, 2001 \$/MMBtu



Source: California Energy Commission, Energy Information and Analysis Division

March 9, 2001

The Honorable Curt Hebert, Jr., Chairman
The Honorable William Massey, Commissioner
The Honorable Linda Breathitt, Commissioner
Federal Energy Regulatory Commission
888 1st Street, N.E., Suite 11-E
Washington, D.C. 20426

Dear Mr. Chairman and Commissioners:

This letter is to request on behalf of our three states, California, Oregon and Washington, that the Federal Energy Regulatory Commission take steps on an interim basis to restrain the unreasonably high wholesale costs of electricity in our region. Specifically, we would suggest something like the plan proposed by Commissioner William Massey of the Federal Energy Regulatory Commission in a February 8th speech. He recommended:

“ . . . a temporary cost-based price cap on spot market sales in the western interconnection. Such a price cap could be calculated on a generator-by-generator basis at each generator’s variable operating costs plus a reasonable capacity adder perhaps in the range of \$25/mwh. New generation sources should be exempt. In addition, such a cap should have a well-specified sunset provision, tied either to a date certain or the attainment of certain specific conditions, such as some measure or adequate reserves.”

Such a price cap would allow generators to recover all of their operating costs plus a return. Of course, bilateral contracts and long-term contracts would be exempt in order to encourage a long-term, market-based solution.

We understand that some of the federal power marketing agencies such as BPA, which are not controlled by the FERC, would voluntarily adhere to such a plan.

While we fully recognize the benefits of a free market, our problem is that we have a shortage of electricity. In spite of our aggressive and urgent efforts, the problem will only get worse throughout the year and particularly this summer. This shortage has enabled, and, is enabling generators to receive “unjust and unreasonable” charges for their wholesale energy. Indeed, a report prepared by the California ISO’s Department

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The Honorable William Massey
The Honorable Linda Breathitt
March 9, 2001
Page Two

of Market Analysis concluded that 21% of real time energy costs during December 2000, and 63% of real time energy costs for January 2001, represent charges that may exceed just and reasonable levels. We attach a chart which compares California wholesale costs for the last 3 years.

These excessive charges have virtually bankrupted California's two largest utilities, Pacific Gas & Electric and Southern California Edison, while the generators have earned record profits which exceed 1999 levels by several hundred percent. The ISO report, which is on file with this Commission, indicates these charges are significantly above costs.

The reasons for the shortages are well known. These include a severe drought, a shortage of natural gas, a damaged natural gas pipeline, inadequate transmission, and the failure throughout the Western states over a period of years to build sufficient generating capacity to meet the expanding demand.

We are taking aggressive actions in each of our states to deal with the problem. For example, in California since April 1999, nine new major power plants (eight of which will produce 500 MW or more) have been licensed. Six are under construction. These plants, together with new peaking and renewable facilities, will total approximately 5,000 MW of new power production on line. By summer 2002, approximately 5,000 additional MW will be on line.

We are also taking aggressive actions on energy efficiency on demand reduction. In California, we are also creatively resolving environmental issues including emissions requirements. These actions include a \$800 million energy conservation program in California. We are attaching news releases which describe these actions in more detail.

We will continue to implement every reasonable action to deal with this crisis. But in spite of our best efforts the present shortage is likely to get worse. The California ISO forecasted a shortage of 4,100 MW in its report of November 30, 2000 – before the drought of this winter further diminishes supplies. Estimates of the shortage in California are now as high as 6,800 MW.

Under its new law California is seeking long-term contracts for its energy supply and has had some real success in doing so. However, short-term contracts signed by the Department of Water Resources have required prices averaging \$228 per MWh. Some 25% of the power necessary to serve load will still be required to be purchased in the

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Page Three

more expensive hour-ahead and day/markets. Of course, the relief we are requesting will be necessary only in the event of a shortage and only for this year.

The economy of our region depends, we believe, upon successfully managing this energy crisis. As Chairman Alan Greenspan stated in testimony before Congress in January, prolonged energy troubles in the world's sixth largest economy could jeopardize the nation's economic health. We urgently request your help.

Sincerely,

GRAY DAVIS
Governor of California

GARY LOCKE
Governor of Oregon

JOHN KITZHABER
Governor of Washington

May 25, 2001

The Honorable George W. Bush
The President
The White House
Washington, D.C. 20500

The Honorable J. Dennis Hastert
The Speaker of the House of Representatives
Washington, D.C. 20515

The Honorable Trent Lott
Majority Leader
United States Senate
Washington, D.C. 20510

Dear Mr. President, Mr. Speaker, and Mr. Leader:

We write to express our deep concern about the failure of the Federal Energy Regulatory Commission (FERC) to act effectively to enforce the provisions of the Federal Power Act that require it to set just and reasonable wholesale prices for electricity in California. Under the terms of the Act, FERC is required to ensure that wholesale electricity prices are just and reasonable.

FERC historically met this responsibility by approving wholesale prices that were no higher than the total costs suppliers incur to produce electricity. More recently, FERC has given suppliers "market-based pricing authority" in situations where it was able to conclude that market-based pricing would lead to better outcomes than continued cost-based regulation. FERC retains the responsibility to ensure that wholesale prices are just and reasonable when a state decides to rely on a competitive wholesale electricity market to provide for its citizens' electricity needs. In particular, once FERC has granted suppliers market-based pricing authority it has an ongoing responsibility to ensure that these prices reflect the outcomes of well-functioning competitive markets. If well-functioning competitive markets do not exist and, as a consequence, the resulting prices are not just and reasonable, then FERC should act either to remedy the market failures or to return to cost-based regulation.

In its November 1, 2000 preliminary order and December 15, 2000 final order, FERC stated that wholesale electricity prices in California were unjust and unreasonable. The actions taken by FERC in its December 15, 2000 final order have not remedied the problems. Moreover, as forecast by many parties commenting on the November 1, 2000 preliminary order, these actions resulted in significantly higher wholesale prices and contributed to further degradation of system reliability in California. Our review of FERC's most recent proposals for remedies leads us to conclude that they will be ineffective and unlikely either to enhance system reliability or reduce prices during the summers of 2001 and 2002.

Well-designed competitive wholesale electricity markets can provide long-term benefits to consumers. For sixty years FERC implemented its obligations to set just and reasonable rates under the Federal Power Act by regulating wholesale market prices. During the 1990s, based on the belief that if appropriate criteria were met "market-based rates" could produce lower prices and a more efficient electric power system, FERC changed its policy. It began to allow suppliers to sell wholesale electricity at market-based rates but, consistent with FERC's continuing responsibilities under the Federal Power Act, only if the suppliers could demonstrate that the resulting prices would be just and reasonable. Generally, FERC allowed suppliers to sell at market-based rates if they met a set of specific criteria, including a demonstration that the relevant markets would be characterized by effective competition.

All generators and marketers selling power into California were granted the ability to receive market-based rates rather than cost-of-service rates because they were able to demonstrate to FERC that their participation in the California market would result in market prices reflecting the interplay of supply and demand in well-functioning competitive markets. These showings were based on a variety of market-structure screens adopted by FERC before California's wholesale electricity markets went into operation. Numerous *subsequent* studies based on *actual* market behavior and performance have identified a number of serious problems of market design, supplier behavior, and market performance that were not anticipated or considered in FERC's initial market-structure screens. There are numerous flaws in California's wholesale electricity markets, and their consequences have been significantly exacerbated by the tight supply situation in the Western U.S. We cannot expect a market to operate to benefit consumers or for the resulting wholesale prices to satisfy the requirements of the Federal Power Act if effective competition does not exist.

We strongly advocate that FERC be directed to fulfill its responsibilities and take the actions necessary to alleviate the market-performance problems that have led to unreasonable prices. We are mindful of the potential dangers of applying a simple price cap, the maximum price that all sellers can receive, to a truly competitive market where the interplay of supply and demand happens to yield prices higher than some might like. But California's electricity markets are not characterized by effective competition. In this case, cost-of-service prices are an obvious remedy that satisfies the just and reasonable rate standard. In addition, various parties have submitted proposals to FERC for temporary market interventions that would ensure just and reasonable wholesale electricity prices in California until many of the new power plants currently under construction in California are completed. These proposals do not require price caps on the spot market and thus avoid the problems caused by a simple price cap. However, all of these proposals require FERC to implement market-rule changes that guarantee wholesale prices in California are just and reasonable by setting selling prices for a significant fraction or for all of the output sold by generators and marketers serving California. These proposals have also been very sensitive to ensuring that prices will not

be constrained to levels below the costs of new entrants or levels that will discourage sales from existing facilities into California over the next two years.

The events in California during the last year have done serious damage to the evolution of competitive wholesale and retail electricity markets in many parts of the country where electricity industry restructuring and competition have not progressed very far. Several states that had planned to introduce reforms soon are now delaying them. Others will not consider further reforms until FERC demonstrates its ability to identify and its readiness to remedy quickly and effectively serious wholesale market-performance problems.

Creating a well-functioning electricity market in California as soon as possible is the best way to ensure that competition in wholesale electricity will spread throughout the US and provide the greatest possible benefits to consumers.

Designing a well-performing competitive electricity market is an extremely complex evolutionary process. The public must have confidence that the federal government will work cooperatively with the states to establish appropriate restructuring, market-design, and market-monitoring programs so that when market-performance problems emerge FERC will act quickly and effectively to mitigate them. The Federal Power Act gives FERC both the responsibility and the tools to act when wholesale markets produce unjust and unreasonable rates for sustained periods of time. FERC's failure to act now will have dire consequences for the State of California and will setback, potentially fatally, the diffusion of competitive electricity markets across the country. Moreover, this negative experience with electricity re-structuring could delay or reverse current efforts to introduction competition into other formerly regulated industries.

Sincerely,

Roger Bohn
Associate Professor of Management
Graduate School of International Relations and Pacific Studies
University of California—San Diego
(Former Member, California Power Exchange Market Monitoring Committee)

Peter Cramton
Professor of Economics
University of Maryland
(Member, California Power Exchange Blue Ribbon Panel)

Severin Borenstein
E.T. Grether Professor of Business Administration and Public Policy
Haas School of Business
University of California
Director, UC Energy Institute
(Member, Board of Governors of California Power Exchange)

Alfred Kahn
Robert Julius Thorne Professor of Political Economy, Emeritus
Cornell University
(Chair, California Power Exchange Blue Ribbon Panel)

Paul Joskow
Elizabeth and James Killian Professor of Economics
Massachusetts Institute of Technology
Director, MIT Center for Energy and Environmental and Policy Research

James Bushnell
Director of Research
University of California Energy Institute
(Former Chair and Member,
California Power Exchange Market Monitoring Committee)

Alvin K. Klevorick
John Thomas Smith Professor of Law
Professor of Economics
Yale University
(Former Chair,
California Power Exchange Market Monitoring Committee)

Robert Porter
William R. Kenan, Jr. Professor of Economics
Northwestern University
(Member, California Power Exchange Blue Ribbon Panel)

Frank Wolak
Professor of Economics
Stanford University (Chairman, Market Surveillance Committee of the
California Independent System Operator)

Carl Shapiro
Transamerica Professor of Business Strategy
Haas School of Business
University of California
(Former Member, Market Surveillance
Committee of the California Independent System Operator)

The Washington Post, May 16, 2001
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 The Washington Post
 May 16, 2001, Wednesday, Final Edition
SECTION: EDITORIAL; Pg. A23

LENGTH: 938 words

HEADLINE: More Than California's Problem

BYLINE: Gray Davis

BODY:

SACRAMENTO -- As President Bush this week rolls out his new energy policy, I once again urge him to confront the energy elephant in the middle of the room -- the out-of-control wholesale prices of electricity in California and across the West.

In 1996, California ventured headlong into a flawed scheme to deregulate electricity. Although Californians were promised lower rates and plentiful supply, both predictions have turned out to be disastrously wrong. We have now seen our first statewide rolling blackouts since World War II. Unheard-of wholesale prices for power have bankrupted our largest utility, threaten to bankrupt the second largest and have begun to seriously affect our economy. If we don't get the situation under control, it could quickly threaten our national economy.

California bears some fault for the current situation. In addition to the botched deregulation plan, centermost was our failure for the 12 years before I took office to build any major power plants. But my administration has moved quickly to remedy that by streamlining the permitting process for generating facilities. In the past two years, my energy commission has licensed 14 new major power plants, nine are under construction, and four will be on line this summer or fall. Nearly a dozen more are in the pipeline. In addition, we've approved six new "peaker" plants to meet this summer's demand. We're moving at unprecedented speed to deal with the supply problem.

The state, however, has absolutely no jurisdiction over the wholesale prices being charged by the unregulated, mostly out-of-state generators that purchased the utilities' power plants as part of deregulation. Since the Federal Power Act was passed in 1935, price regulation has been the exclusive domain of the federal government. But the Bush administration and the Federal Energy Regulatory Commission have consistently refused to carry out their statutory obligation to ensure energy prices are "just and reasonable."

To the contrary, the free-market ideologues in the administration argue that uncontrolled market prices are needed in order to increase the supply of electricity. In other words, if we don't allow power generators to shoot the moon on prices, they won't have sufficient incentive to build additional supply. That's as ridiculous as saying we need to pay dairies \$ 300 a gallon to motivate them to produce milk. In fact, I have joined my fellow governors in Oregon and Washington in proposing temporary cost-based pricing that would still allow generators and marketers a healthy profit -- but without bankrupting the system.

Last week, however, Vice President Dick Cheney told the Los Angeles Times that he would remain philosophically opposed to any federal intervention on wholesale power prices even if it threatened the national economy. With all due respect to the vice president, that is one of the most irresponsible statements I've ever heard. Here is the eye-popping result of the federal government's rigid stance: In the spring of 2000, a megawatt of electricity in California cost an average of \$ 30. By last December, after the Federal Energy Regulatory Commission precipitously removed the hard price cap of \$ 250 per megawatt hour that been in effect, the spot-market price shot up to \$ 1,500 for the same megawatt of power. Just last week, we paid an astounding per-megawatt record of \$ 1,900 to Houston-based Reliant Energy for the last 100 megawatts of power we needed to keep the lights on.

The macro result of this unconscionable price gouging is predictable -- and scary. In 1999, California power users paid approximately \$ 7 billion for all electricity consumed. Last year, that figure shot up to \$ 27 billion. This year,

estimates are that total spending on electrical power may hit \$ 50 billion to \$ 60 billion.

The California Independent System Operator, the state's electric grid manager, has estimated in a report to the federal energy commission that electricity overcharges during the past year have totaled more than \$ 6 billion. Even the federal commission itself has formally ruled that the electricity market in California is dysfunctional and that prices charged have been unjust and unreasonable.

Where is that money going? Simply put, into the pockets of the generators and marketers -- almost all of them in the South and many of them located in Texas. It is one of the most massive transfers of wealth from the consumers of one state to companies located in another region of the country in our nation's history. But other than ordering a pittance in limited refunds -- none of which has yet been returned to the state -- the Federal Energy Regulatory Commission has stood fast in its opposition to real price caps.

The day before President Bush was sworn in, he stated on national television that the energy problem here was California's to solve. Well, we are moving aggressively to do our part to get it under control on both the generation and conservation fronts. But without just and reasonable prices for wholesale power, the crisis inevitably will spill over and damage the already-sluggish national economy.

That, Mr. President, not only will be your problem, it will affect every one of us. Californians are demanding action. We are doing our part, leading the nation in building power plants and in aggressive conservation. The federal government must do its part to temporarily control runaway energy prices in the West until we can bring on line the major new power plants California has approved.

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 The New York Times
 May 31, 2001, Thursday, Late Edition - Final
 SECTION: Section A; Page 27; Column 2; Editorial Desk

LENGTH: 687 words

HEADLINE: Bush's Mistake in California

BYLINE: By Gray Davis; Gray Davis is the governor of California.

DATELINE: SACRAMENTO

BODY:

I hope President Bush understands how perilous a course he is setting for both California and the national economy with his opposition to caps on the outrageously high wholesale price of electricity -- opposition he reiterated to me when we met Tuesday.

California is experiencing an energy shock like that perpetrated by the Organization of Petroleum Exporting Countries in the 1970s. That episode plunged the United States into deep recession and gave rise to a long period of stagflation -- rising prices in a no-growth economy.

The size of the energy shock to California this year is likely to be in the range of \$40 billion to \$50 billion, according to Alan Blinder, the former vice chairman of the Federal Reserve Board. It is enough to threaten the still solid California economy with recession and to knock the nation's gross domestic product down by at least half a percent -- enough to counter the stimulative effects that the Bush tax cut is intended to have on the stumbling national economy. As the Fed chairman, Alan Greenspan, observed in late January, "It is scarcely credible that you can have a major economic problem in California which does not feed to the rest of the 49 states."

The president's energy policy sets long-term goals of self-sufficiency through increased power generation, energy efficiency and fuel supplies. These are many of the same solutions we in California are rapidly pursuing. But the short-run emergency in California stems as much from energy cost as from energy supply.

Since I've been in office, we've cut approval times in half and licensed 15 major power plants. And we have put in place the nation's most comprehensive conservation program. Still, we are being squeezed to the breaking point by outrageous prices for the electricity we buy. This is why I called on the president for an energy policy that includes short-term caps on the price of wholesale power. Under the Federal Power Act of 1935, only the Federal Energy Regulatory Commission has the power to ensure a just and reasonable wholesale electricity market in California. This is not a matter of discretion for federal regulators; it is an obligation. The law requires the F.E.R.C. to ensure that rates are just and reasonable. California itself can do nothing about the unconscionable wholesale electricity prices that are often more than 700 percent higher than they were just a year ago. President Bush must direct the commission to exercise its authority under the law.

In a letter Tuesday to the president, 10 economists warned, "F.E.R.C.'s failure to act now will have dire consequences for the State of California and will set back, potentially fatally, the diffusion of competitive electricity markets across the country."

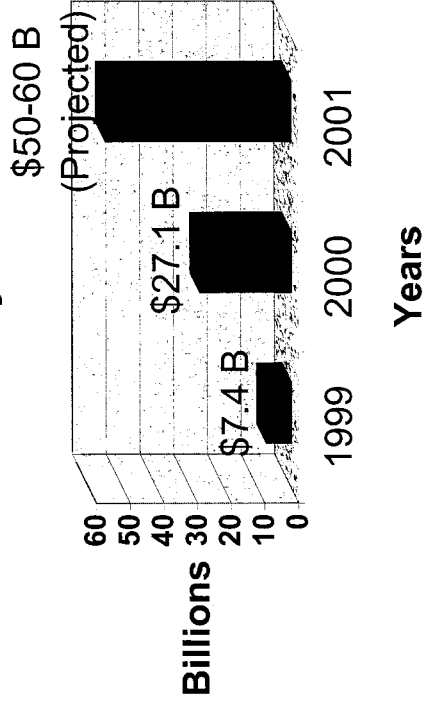
It is true that California's problems stem from a fundamentally flawed 1996 state electricity deregulation law. The utilities were required to sell off half of their fossil-fuel-fired power plants while they were barred from entering into contracts for a long-term supply of cheap electricity. The result is an unregulated sellers' market for electricity, susceptible to naked manipulation.

The agency that runs California's power grid has identified \$6 billion in overcharges by the generators. Prices are greatly inflated. The same electricity that cost Californians \$7 billion in 1999 was \$27 billion in 2000 and is projected to cost upwards of \$50 billion in 2001. Much of this is fed by escalating wholesale natural gas prices that were 1,000 percent higher in Southern California in December 2000 than in December 1999. The F.E.R.C. has failed

to curb these natural gas prices as well.

The Bush administration still maintains that the energy policy it has proposed is all that can reasonably be done and says it opposes further federal intervention in the energy market, even if the problem threatens the nation's economy. The threat is real, and the Bush administration must adopt a more responsible energy policy, one that restrains energy price manipulation and creates a fair and competitive energy market across the West and the whole country.

Total Wholesale Cost of Electricity in California



Source: California Independent System Operator

1999 Per Capita Electricity Consumption

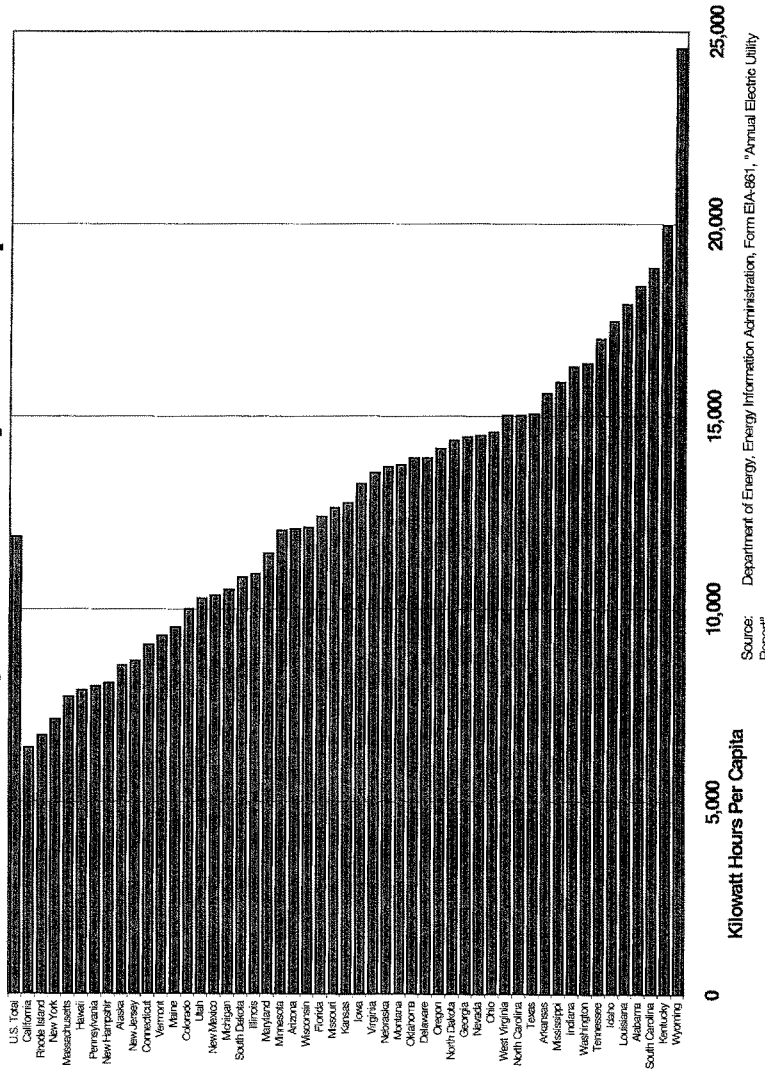


Table 1: Average Monthly Bill By Sector, Census Division and State, 1999
RESIDENTIAL

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Census Division State	Number of Consumers	Average Monthly Consumption (KWh)	Average Revenue (cents per kilowatthour)	Average Monthly Bill (dollars and cents)
New England	5,714,829	597	11.18	66.76
Connecticut	1,381,589	711	11.46	81.50
Maine	625,988	493	13.07	64.46
Massachusetts	2,495,675	581	10.09	58.60
New Hampshire	531,875	560	13.84	77.48
Rhode Island	419,188	529	10.13	53.61
Vermont	280,314	594	12.17	72.29
Middle Atlantic	4,411,991	631	11.31	71.84
New Jersey	3,147,864	650	11.40	74.06
New York	6,601,592	537	13.32	71.51
Pennsylvania	4,562,445	753	9.19	69.22
East North Central	18,098,891	767	8.26	62.86
Illinois	4,622,423	714	8.83	63.10
Indiana	2,505,377	958	6.96	66.70
Michigan	4,058,091	630	8.73	54.96
Ohio	4,630,054	838	8.68	72.82
Wisconsin	2,282,906	712	7.31	52.04
West North Central	8,092,802	868	7.36	63.29
Iowa	1,228,608	805	8.35	67.22
Kansas	1,118,271	846	7.64	64.64
Minnesota	2,017,352	743	7.41	55.12
Missouri	2,405,251	962	7.12	68.48
Nebraska	718,240	920	6.52	60.00
North Dakota	286,494	962	6.50	62.47
South Dakota	318,578	664	7.42	64.10
South Atlantic	21,592,501	1,072	7.72	82.83
Delaware	331,047	889	9.17	81.50
District of Columbia	193,822	706	8.00	56.49
Florida	7,001,021	1,117	7.73	86.34
Georgia	3,295,924	1,056	7.56	79.87
Maryland	1,952,457	996	8.39	83.62
North Carolina	3,474,399	1,047	7.99	83.62
South Carolina	1,724,911	1,145	7.55	86.49
Virginia	2,715,550	1,098	7.48	82.15
West Virginia	813,330	968	6.27	60.76
East South Central	7,151,288	1,181	6.42	76.68
Alabama	1,900,692	1,186	7.03	83.36
Kentucky	1,734,903	1,083	5.58	60.40
Mississippi	1,152,329	1,160	6.75	79.70
Tennessee	2,363,365	1,249	6.34	79.22
West South Central	13,278,842	1,136	7.37	81.71
Arkansas	1,159,684	1,009	7.43	74.94
Louisiana	1,791,240	1,229	7.12	87.54
Oklahoma	1,495,399	1,020	6.60	67.32
Texas	7,832,319	1,155	7.55	87.26
Mountain	6,949,723	808	7.44	80.14
Arizona	1,896,943	989	8.53	84.42

Average Monthly Bill By Sector, Continue, 1999 RESIDENTIAL (esr01.TXT) <http://www.eia.doe.gov/cneaf/electricity/esr/esr01p1.html>

Colorado	1,712,891	639	7.38	47.14
Idaho	516,526	1,098	5.26	57.77
Montana	393,329	776	6.78	52.66
Nevada	760,262	919	7.13	65.52
New Mexico	712,064	544	8.62	46.88
Utah	738,880	703	6.27	44.12
Wyoming	218,808	771	6.34	48.88
Pacific, Contiguous	15,746,792	691	6.53	58.89
California	11,326,501	548	10.71	58.70
Oregon	1,408,927	1,088	5.75	61.40
Washington	2,390,364	1,144	5.10	58.34
Pacific Noncontiguous	590,927	642	13.01	89.57
Alaska	227,247	684	11.16	76.34
Hawaii	363,680	816	14.30	88.09
U.S. Total	309,817,057	868	8.36	70.68

esr01.TXT (page 1 of 3) [\(Next Page\)](#) [\(Last Page\)](#)

Notes: 0Data are final. Commercial or industrial billings are generally determined by the level of demand and consumption of electricity rather than by consumer economic activity. Average monthly consumption in kilowatthours is calculated by dividing the megawatthours by 12(months), dividing the results by the number of consumers, and multiplying by 1000(to convert to kilowatthours). The average revenue is calculated by dividing the revenue by the megawatthours, then multiplying by 100 (to convert to dollars and cents). The average monthly bill is calculated by dividing the revenue by 12(months), dividing the result by the number of consumers, and multiplying by 1000(to convert to dollars and cents).

Source: Energy Information Administration, Form EIA-861, "Annual Electric Utility Report", and calculated from the data shown in Tables 14, 15 and 16.



**Testimony Submitted By
Oregon Governor John A. Kitzhaber, M.D
Before The
Senate Governmental Affairs Committee Regarding
The Role of the Federal Energy Regulatory Commission Associated with the
Restructuring of Energy Industries
June 20, 2001**

I appreciate the opportunity to offer my perspectives on the role of the Federal Energy Regulatory Commission (FERC) and, specifically, its response to the western power crisis.

Let me start with three interrelated facts about the western wholesale power market. One, we do not have a well-functioning market. Two, we do not have effective competition. Three, we do not have "just" and "reasonable" wholesale power rates. These are unassailable facts. These are facts acknowledged by the FERC through its own pronouncements. These are facts that demand effective, comprehensive action by the FERC and yet it has refused to intervene.

Last winter, I -- along with my fellow Governors of California and Washington -- first called on the FERC to impose cost-plus pricing or some other form of temporary price controls in the Western wholesale power markets. Our concern then, as now, is that the exorbitant, unlawful wholesale prices our utilities are paying to a handful of power marketers ripple through our economies straining household budgets, putting people out of work, and causing general business slowdown.

While FERC fiddles, we are seeing the effects of the monopolistic wholesale prices that have burdened the West. Businesses are shutting down or curtailing operations, laying off thousands of workers. Schools are cutting back on essential programs in order to pay for electricity. Low-income households are sacrificing basic necessities to pay higher energy bills. We face major setbacks in our efforts to revitalize fisheries due to the hard tradeoffs required in the current energy environment. And a four-fold increase in Bonneville Power Administration power rates looms that will cause even greater harm to our households, our businesses, and our economy. Without immediate pricing changes, the situation will only worsen.

FERC and the Bush Administration have attacked temporary price controls on three counts.

First, temporary wholesale power pricing reforms do not measure up to the Bush Administration's simplistic policy criteria of "does it reduce demand or increase supply." In the words of Commissioner Massey, the Administration is "ignoring the elephant in the living room." Yes, we should be stimulating investments in energy efficiency and

new supplies. But, we cannot close any supply gap fast enough to significantly temper the prices utilities are paying in the wholesale market today and will be paying in the near term. Supply is an issue but so is the fact that we also we have a serious, short-term price problem that needs to be addressed.

Second, temporary wholesale power pricing reforms will have a debilitating effect on the development of new supplies and on efforts to reduce demand. High prices can reflect scarcity of a good or they can reflect sheer market power by a few sellers. The two should not be confused. Crafted properly, temporary price controls will eliminate any incentive for the owners of existing facilities to withhold power from the market to maximize profits – which I believe has occurred. By doing so, that will bolster supplies not lessen them.

Further, wholesale power pricing reforms can be crafted that provide more than sufficient incentives to developers to build new power plants. Various workable proposals – including some from one of my state agencies – have been submitted to FERC for its consideration. All would provide a reasonable return for energy producers while providing needed short-term rate relief. It is incumbent on the FERC to examine and develop those proposals as quickly as it can.

In addition, the imposition of temporary cost-plus pricing or other pricing reforms will not hurt our efforts to conserve energy. Indeed, I think that the reverse is true. With the unprecedented run-up in wholesale prices, we have largely reduced demand in the Northwest by shutting down businesses, reducing household amenities, and slowing our economy and not through permanent investments to make our homes and businesses more energy efficient for the long haul.

Three, temporary price controls will not be temporary. This is the most disingenuous criticism. We seek rate stability until power supplies increase and functioning market conditions prevail and no longer. When that occurs, any form of price control will naturally wither away. Further, whatever FERC establishes, it obviously can change later.

For the long run, a competitive wholesale power market can yield benefits. But, if we cannot be assured that FERC will respond quickly and effectively to remedy serious market defects, then I believe that we must revisit the policy to promote open, competitive wholesale power markets. Our citizenry will demand it.

FERC has failed miserably in its handling of the western power situation. Its failure to act to moderate short-term prices has benefited the few at the expense of tens of millions of households and businesses in the West.

Sound public policy should serve the best interests of the most people – not the narrow interests of a few. Legislation is needed to do what the FERC will not do – protect Western consumers from the consequences of manifestly unjust and unreasonable wholesale power prices.

In addition to raising concerns about the handling of the western power crisis, I want to take this opportunity to address other FERC issues that the Committee should take under consideration.

I understand that FERC may be supporting proposals to preempt state siting authority for transmission lines. I believe this is unwise and untenable. States and local governments have siting jurisdiction for good reasons. They are the governments closest to the individuals affected by the impacts of large transmission and generation projects. They are in the best position to mitigate those impacts and consider a range of alternatives.

FERC should require transmission owners and new regional transmission institutions to develop and implement an integrated transmission and generation planning process. They should be required to consider alternatives to costly infrastructure such as efficiency, load management strategies, distributed generation, and new transmission technologies. And in order to provide incentives for rational, cost-effective, and environmentally sound decisions, FERC should implement Performance Based Ratemaking that specifically rewards transmission owners that provide more efficient and more reliable transmission service. Just rewarding monopoly transmission providers with higher rates of return and higher profits doesn't necessarily achieve these public interest goals.

FERC should require full disclosure of all transmission and generation information in real-time, or as close to real time as is possible. Current Energy Information Agency (EIA) confidentiality policy is a major impediment to a workable, competitive wholesale market. It protects suppliers in a position to exercise market power but endangers consumers who are vulnerable to market power abuse. Markets only function efficiently and fairly when participants are fully informed of available supply and demand options.

Finally, on Monday FERC announced its plan to address the western power crisis. We are still reviewing the details of the FERC Order and will submit additional testimony to the Committee as soon as we have completed that review. Our initial review indicates that FERC now recognizes that the western power market is dysfunctional, and offers limited strategies, which in our view do not go far enough to deal with the severity of the problem. While the severe wholesale price spikes will be moderated by the plan, it will not ensure "just" and "reasonable" pricing on an on going basis.

Thank you for the opportunity to provide testimony on these important FERC issues.

Statement of **Jerry Ellig**, Ph.D.
Senior Research Fellow
Mercatus Center at George Mason University

submitted to the

U.S. Senate Committee on Governmental Affairs
340 Dirksen Senate Office Building
Washington, D.C. 20510

June 20, 2001

Dear Senator Thompson. Thank you for the opportunity to submit comments for the record on the committee's forthcoming hearing *The Role of the Federal Energy Regulatory Commission Associated with the Restructuring of Energy Industries*. As you know, I am a senior research fellow specializing in regulatory issues with the Mercatus Center at George Mason University.

The Committee is aware that the various states are in different stages of retail electric restructuring. Although it is too early to identify definitive results in most states, it is important to note that there are some clear successes. California has, of course, received enormous publicity as an alleged example of the "failure" of electric restructuring. Pennsylvania has received much less attention—which is unfortunate, because Pennsylvania is electric restructuring's most prominent success story.

I would like to address three topics today: The source of California's power crisis, the state's lack of success in encouraging retail electric competition, and Pennsylvania's relative success in avoiding California-style problems in both the wholesale and the retail markets.

THE CALIFORNIA POWER CRISIS AND THE WHOLESALE MARKET

California's much-publicized blackouts have actually occurred due to forces largely separate from electric restructuring. Electricity demand in California has risen by 25 percent during the past eight years, but generating capacity has increased by only 6 percent. No new power plants have been built in California for 12 years. After California's restructuring legislation was enacted in 1996, several companies applied for permission to build new power plants, but not one had been approved by the summer of 2000. Until the current crisis prompted California to speed up its approval process, the state's permitting process for power plants took three times as long as in Texas. The Los Angeles Times has reported that California's largest independent power producer plans to build a plant on an Indian reservation so it will only have to deal with federal regulations.

Investors who purchased the utilities' divested power plants at a premium foresaw this imbalance, which is why they were willing to pay such high prices for power plants that some people speculated would lose a lot of their value once competition arrived. The wholesale market price of power seems to indicate that additional capacity is needed, but no significant new power plants or transmission facilities have been built in California for more than a decade. In the meantime, the state's economy has boomed, boosting demand. Since the price spikes occurred after California claimed to deregulate the retail market, "deregulation" gets blamed for the price increases.

It is instructive to consider how California's utilities would have dealt with the supply-demand imbalance in the absence of restructuring. Instead of paying market prices for power to the owners of divested power plants, the utilities would still own the plants. But under old-fashioned monopoly regulation, neither the utilities' plants nor the independently owned power

plants would be capable of generating any more power than they currently generate under a less regulated system. At peak periods, the supply-demand imbalance would still exist. Regulators and utilities would face the same choice they face under today's system: allow retail prices to increase to cut back demand, or ration electricity through blackouts, brownouts, and mandatory consumption curtailments for large users. As economist Robert Michaels noted in the summer of 2000, "This is reality, and markets force people to face it in ways that politicians live to help them avoid. Things are tight all over the West, there isn't much demand flexibility, new plants are taking forever to arrive, and the simple choice is between high prices and shortages."

There are, of course, widespread allegations that power producers in California gamed the system by withholding power supplies in order to raise prices. Power companies maintain that they only took supplies off the markets when plants needed to be shut down for maintenance. The element of judgment involved in maintenance decisions suggests that we may never know for sure whether power producers deliberately sought to raise market prices by withholding capacity.

It is worth noting, however, that the structure of California's wholesale and retail markets may well have permitted and encouraged such strategic behavior. The power that utilities sell at a fixed price to consumers is procured in a volatile spot market. Consumers are entitled to purchase as much power as they want at the fixed, regulated price, regardless of the cost of power at the time they want to use it. As a result, utilities (and now the state government) are virtually compelled to pay almost any price for spot market power when consumer demand is strong and supplies are tight. In economic terms, wholesale demand for power is highly inelastic. A small decrease in supply can lead to large price increases in the wholesale market. In such an environment, it would not be surprising if some power producers tried to test their

ability to affect prices by withholding supply. The market was structured in a way that encouraged such behavior.

It is one thing to say that power producers might withhold supply in order to raise prices; it is quite another thing to agree on an appropriate solution. Price controls may appear to solve the problem by preventing prices from rising above some specified level. However, price controls carry their own costs and dangers that have been well-documented by economists over the course of several centuries. In addition, price controls fail to address the underlying reasons for the price spikes: artificially inelastic demand and constraints on new supply. A genuine solution to alleviate the price spikes is to restructure the market so that retail and wholesale demand are more responsive to price (as my future colleague Vernon Smith has discussed in detail) and to remove regulatory obstacles to construction of new power plants (which California has now started to do.)

RETAIL ELECTRIC COMPETITION IN CALIFORNIA

California has a reputation for being the first state to deregulate its electric market, but California's plan suffered from several significant flaws. Until late 2000, utilities had to purchase all of their power through a state-mandated, centralized Power Exchange. They could not make bilateral deals with individual generators, which would let them avoid inefficiencies or "gaming" made possible by poorly designed Power Exchange rules. They could not sign long-term contracts for power with individual generators, which might help mitigate price fluctuations. Retail competition is also distorted by mandated rate cuts, mandated rate freezes, and an accelerated stranded cost recovery schedule. These three factors have essentially prevented the development of competition in the retail market for residential and small business customers.

California ranks surprisingly low in an independent assessment of the openness of state electricity markets. The Center for the Advancement of Energy Markets (CAEM), with which I am affiliated, has developed the Retail Energy Deregulation Index -- a list of 22 attributes that measure the extent to which each state has put in place policies that will lead to a workably competitive retail electricity market. CAEM surveys state public utility commissions to ascertain their progress on each attribute and synthesizes the results into a ranking that allows each state to see where it compares nationally. (Scholars affiliated with the Mercatus Center and George Mason University have found CAEM's data extremely helpful, and I would recommend that the Committee make use of this information. It is available to representatives of the public sector at www.caem.org.)

The state ranks only 13th on the CAEM's RED Index, despite the fact that California was the first state to enact restructuring legislation. Many of the other states that restructured relatively early rank near the top, including (1) Pennsylvania, (2) New York, and (3) Maine. Even jurisdictions that acted more recently, such as Arizona (1998), Maryland (1999), New Jersey (1999), and the District of Columbia (2000) outrank California. Given this ranking, it should come as no surprise that California's deregulation effort has been plagued by problems and has resulted in relatively little customer switching in the residential market. Of course, lack of customer switching does not necessarily indicate that the market is uncompetitive. Even in a fully competitive system, the vast majority of customers might choose to take service from their familiar old utility, or its marketing affiliate, if they perceive the utility to offer the best deal. But the structural analysis underlying the RED Index suggests that the lack of switching in California is due to a poorly designed market.

PENNSYLVANIA: A RESTRUCTURING SUCCESS STORY

Pennsylvania probably provides the best example of successful electric restructuring. Since its retail competition program was enacted, more than 500,000 Pennsylvania customers have switched electricity suppliers. The Pennsylvania Office of Consumer Advocate reports that more than 444,000 of these are residential customers. In addition, Pennsylvania ranks first in the RED Index, which suggests that it has done a good job of creating an environment conducive to competition. More residential customers have switched suppliers in Pennsylvania than in all other states combined. Approximately 20 percent of Pennsylvania's customers have switched, compared to 2 percent for California.

Entry of new supply is also easier in Pennsylvania than in California. In the Pennsylvania-New Jersey-Maryland Power Pool, 1,000 mw of new generation were built in 2000, and the power pool expects an additional 15,000 mw to come on-line by 2005. The Pennsylvania Department of Revenue projects that average electricity prices in Pennsylvania will be 16.9 percent lower in 2004 than they would be if regulation had continued. Prices will be 14.6 percent lower for residential customers, 18.8 percent lower for commercial customers, and 17.9 percent lower for industrial customers. The Pennsylvania Public Utility Commission estimates that competition saved electricity customers \$750 million in 1999.

A key factor affecting the success of competition is the extent to which state policies distort price relationships from those that would exist in a truly competitive market. A comparison of retail competition in California vs. Pennsylvania illustrates how price distortions can undermine competition.

In California, the state's "deregulation" legislation ordered utilities to give residential and small commercial customers a 10 percent rate cut. As a result, residential customers received a rate cut even if they made no effort to learn about competitive offers or switch to a new power supplier. The value of this "gift" becomes even greater when one considers that as long as the rate cut is in effect, residential customers who stick with their utility are also protected from increases in the market price of power. As a result, the only California residential customers who initially paid higher prices because of the price spikes were those served by San Diego Gas & Electric, which was not subject to rate caps in the summer of 2000 because it had recovered all of its stranded costs. The recovery period for utilities' stranded costs was also accelerated, so that utilities received the opportunity to recover these costs over four years. Customers who switch suppliers must still pay these costs—a fact that further diminishes their incentive to shop around.

Pennsylvania, on the other hand, adopted smaller rate cuts whose size and length were negotiated on a utility-by-utility basis. Customers who choose alternative suppliers receive a "shopping credit" representing the amount per kwh that they no longer have to pay for electricity they are no longer purchasing from the utility. The shopping credit is always less than the utility's unbundled generation rate, so customers who switch still make a contribution to cover stranded costs. According to the Federal Trade Commission, the recovery period for these investments will be approximately 10 years, which regulators believe is closer to the useful life of the assets. These policies effectively mean that the price paid by Pennsylvania customers who switch suppliers is closer to the true, free-market price than the price paid by customers who switch in California.

Residential customers in Pennsylvania can achieve savings of 13-29 percent by opting for competitive suppliers. Before the current power crisis, California customers could save 5-6 percent at most. (See Table 1.) Almost all of the alternative suppliers available to California residential customers sell various forms of renewable energy that are sometimes more expensive than power offered by the utilities. Such suppliers are competitive only because renewable power is heavily subsidized in California and because some customers are willing to pay a premium for “green” power.

California’s policies significantly distort price relationships in ways that reduce the customer’s benefit from switching power suppliers, and thus they discourage alternative suppliers from competing in the residential market. Pennsylvania’s policies involve much less distortion. California’s mandated price cuts are larger, and so are the charges for stranded costs that customers cannot escape when they switch suppliers.

Table 1: Competitive Options in California vs. Pennsylvania (Pre-CA Power Crisis)
(Utilities are italicized.)

CALIFORNIA			PENNSYLVANIA		
	Sample bill, 500 kwh	Maximum % Savings		Sample bill, 500 kwh	Maximum % Savings
<i>PG&E</i>	<i>\$54.89</i>		<i>Allegheny Power</i>	<i>\$16.22</i>	
Competitors, standard	\$54.66-57.14	0.4	Competitors, standard	\$12.97	20
Competitors, Renewable	\$51.89-66.89	5.5	Competitors, renewable	\$29.95-36.40	No savings
<i>SCE</i>	<i>\$59.32</i>		<i>Duquesne</i>	<i>\$24.00</i>	
Competitors,	\$61.57	No savings	Competitors,	\$19.20-	20

standard			standard	\$23.00	
Competitors, Renewable	\$56.32- \$71.32	5.0	Competitors, renewable	\$30.45- \$36.40	No savings
<i>SDG&E</i>	<i>\$49.10</i>		<i>GPU Energy – Met Ed</i>	<i>\$22.63</i>	
Competitors, standard	\$51.35	No savings	Competitors, standard	\$18.10- \$26.75	20
Competitors, renewable	\$46.10- \$61.10	6.1	Competitors, renewable	\$31.45- \$39.40	No savings
			<i>GPU Energy – Penelec</i>	<i>\$22.64</i>	
			Competitors, standard	\$18.11- \$26.75	20
			Competitors, renewable	\$31.45- \$39.40	No savings
			<i>PECO Energy</i>	<i>\$27.75</i>	
			Competitors, standard	\$22.60- \$27.90	18.6
			Competitors, renewable	\$24.00- \$39.40	13.5
			<i>Penn Power</i>	<i>\$27.42</i>	
			Competitors, standard	\$19.36- \$30.50	29
			Competitors, renewable	\$29.95- \$36.40	No savings
			<i>PPL Utilities</i>	<i>\$24.28</i>	
			Competitors, standard	\$18.52- \$25.65	24
			Competitors, renewable	\$31.35- \$39.40	No savings
			<i>UGI</i>	<i>\$21.58</i>	
			Competitors,	\$17.27- \$23.25	20

			standard		
			Competitors, renewable	\$31.45- \$39.40	No savings

Sources: California Office of Ratepayer Advocates Shopper's Guide for Residential and Small Commercial Customers (March 1, 2000); Pennsylvania Office of Consumer Advocate Price Comparison Charts (July 31, 2000).

Electric restructuring has the potential to create net benefits, but not all restructuring plans are equally effective at moving from monopoly to competition. In particular, California's restructuring plan has hampered the development of a competitive retail market, while Pennsylvania's restructuring plan has been the most successful at promoting competition and producing consumer savings.

Examined in the broader U.S. context of deregulation and competition, California's unpleasant experience with electric restructuring is the exception rather than the rule. Deregulation and competition tend to produce lower prices and greater nonprice benefits than monopoly regulation. The appendix to this testimony contains an extensive review of the deregulation experience in other industries, which was recently submitted to the Federal Trade Commission in response for the Commission's request for comments on electric restructuring.

Again, thank you Senator. If I can be of any further assistance, please feel free to contact me at 703.993.4930.

MERCATUS CENTER
GEORGE MASON UNIVERSITY
REGULATORY STUDIES PROGRAM

**Public Interest Comment on
The Federal Trade Commission's Notice Requesting Comments on Retail
Electricity Competition Plans¹**

V010003

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP employs contemporary economic scholarship to assess rulemaking proposals from the perspective of the public interest. Thus, our response to the Federal Trade Commission's request for comments on retail electricity competition does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of retail electricity competition on overall consumer welfare.

The Commission's notice requesting comments notes that substantial price increases and reliability problems have occurred in some states that have restructured their electricity markets with the goal of promoting retail competition. The Commission seeks information that will assist it in (1) assessing the advantages and disadvantages of different approaches to restructuring and (2) recommending what, if any, further federal action is desirable. We commend the Commission for seeking more information. Experience shows that restructuring can deliver benefits to consumers, but not all restructuring plans are equally beneficial. The Commission's study should play a helpful role in identifying best practices and highlighting problems to avoid.

I. SUMMARY OF MERCATUS ANALYSIS

Retail competition in electricity has the potential to produce significant price and nonprice benefits for consumers. Experience in a variety of other deregulated industries shows that competition and deregulation tend to produce price reductions of between 10 percent and 25 percent, along with service quality improvements whose value to consumers sometimes exceeds the value of the price reductions. These consumer benefits reflect both the static efficiency that results from the elimination of market power and the dynamic efficiency that results from innovation.

¹Prepared by Jerry Ellig, Ph.D. Dr. Ellig is a Senior Research Fellow at the Mercatus Center at George Mason University. The views expressed herein do not reflect an official position of George Mason University.

The consumer benefits arise not just because prices are likely to be lower, but because deregulated, competitive markets tend to produce prices that are more accurate signals of real resource scarcities. Retail competition would facilitate innovative price structures that would reward customers for shifting consumption away from peak times. If regulation holds prices below the levels that would exist in a competitive market, then short-term price increases induced by deregulation would actually benefit consumers by channeling scarce resources to their most highly-valued uses in the short run and providing incentives to increase capacity in the long run.

Electric restructuring has the potential to create net benefits, but not all restructuring plans are equally effective at moving from monopoly to competition. In particular, California's restructuring plan has hampered the development of a competitive retail market, while Pennsylvania's restructuring plan has been the most successful at promoting competition and producing consumer savings.

II. PROSPECTIVE BENEFITS OF RETAIL COMPETITION

Deregulation and competition tend to produce lower prices and greater nonprice benefits than monopoly regulation. This occurs because of both static and dynamic efficiencies. When regulation holds prices below market-clearing levels, however, deregulation could lead to price increases that are nevertheless efficient. Such price increases actually enhance consumer welfare in both the short run and the long run, by allocating scarce resources to their most highly-valued uses and providing effective signals that additional capacity is needed. Competitive and deregulated retail markets also tend to produce efficient price structures that induce customers to shift usage from peak to non-peak times, reducing costs by reducing expensive investments in peak-load capacity.

A. Static and dynamic efficiencies

1. Price effects

Proponents and opponents of deregulation often debate whether it will produce higher or lower prices than monopoly regulation. Experience shows that deregulation usually produces lower prices, for two reasons: competition constrains market power, and deregulation produces incentives for cost reduction that lead to lower cost levels than under regulation.² In other words, deregulation promotes both "static" and "dynamic" efficiency.

It is important to keep both effects in mind when analyzing the impact of deregulation. Because deregulation creates incentives for cost reduction, the long-run effect on prices is likely to be larger than predicted if one simply assumes that competition will drive prices down to reflect cost levels that currently exist under regulation. In addition, the potential for cost reduction implies that deregulation can produce lower price levels even in the presence of market power. Thus, deregulation can make consumers better off even if the resulting competition is "imperfect" by the standards of either textbook economics or antitrust practice.

² See section III below.

2. Nonprice effects

As important and substantial as the price reductions attributable to competition are, the nonprice effects are just as, if not more, important. Deregulation in network industries has unleashed waves of entrepreneurial creativity that cut costs, improved service quality, and led to the introduction of new products and services. Such improvements, though harder to predict accurately in advance, were nevertheless substantial.

Economic projections prior to deregulation typically under-estimated the size of the price reductions and failed to account for new products and services that create substantial value for consumers.³ If past experience in other industries is any guide, the total value of benefits to consumers from electricity competition could easily be two or three times the projected value of price reductions.⁴

B. Efficient price levels

Although deregulation usually produces lower prices than under regulation, this need not always occur. Price increases, however, do not necessarily mean that deregulation has not “worked.” If regulation holds prices below the level sufficient to evoke new supply, then regulation creates inefficiencies even though it appears to produce prices lower than those that would occur in a deregulated market.

The most prominent historical example of such inefficiency was federal regulation of wellhead natural gas prices. Under regulation, interstate purchasers of gas effectively received less secure services as the reserves dedicated to serving them shrank in response to price controls. During the cold winters of 1971-1972 and 1976-1977, factories and schools in the East and Midwest closed because there was simply not enough gas available at regulated prices to serve all customers. One study estimated that the costs associated with reduced service quality actually outweighed any benefits consumers received because regulation held down the price of gas that had already been discovered.⁵ In the face of scarce supply, price ceilings created shortages and impaired reliability.

Something similar could happen in the electric industry. The simplest scenario to imagine would occur in states like California, where dissatisfaction with electric restructuring could lead to the imposition of more binding price caps in the wholesale electric market.

Another type of price regulation threatens to create inefficient signals in states that are very different from California. In some states with moderate electric rates and low-cost utilities, regulators and legislators have expressed reluctance to eliminate cost-of-service regulation because they believe free-market price of electricity would actually exceed the price under

³ See Clifford Winston, “U.S. Industry Adjustment to Economic Deregulation,” *Journal of Economic Perspectives* 12:3 (Summer 1998): 89-110; “Economic Deregulation: Day of Reckoning for Microeconomists,” *Journal of Economic Literature* 31 (September 1993), pp. 1263-1289.

⁴ See Section III below.

⁵ Appendix, pp. 13-14.

traditional cost-of-service regulation. When such states engage in retail restructuring, they often seek to retain cost-of-service regulation for the utility's "standard offer" or "default" service.⁶ Like wellhead price regulation for natural gas, continued cost-of-service regulation in electricity is an attempt to redistribute "rents" from the owners of the supply to the customers. Over time, this approach could create the same types of problems created by wellhead price regulation. Construction of new capacity would be discouraged, because new capacity must compete against below-market prices established by cost-of-service regulation. In this way, policymakers' initial skepticism of deregulation creates a self-fulfilling prophecy: the cost-of-service regulation that was retained in case competition fails to develop actually prevents competition from developing.

C. Efficient price structures

In addition to the level of prices, deregulation and competition also affect the structure of prices. Regulated monopolies tend to charge average-cost prices that do not vary much by time of day or season of the year. Deregulated, competitive firms tend to give their customers the option of either paying prices that vary with supply and demand, or paying a risk premium sufficient to cover the cost of retaining sufficient peak capacity to meet customer demand at a fixed price. This is an especially important issue in the electric industry, because electricity is not storable, and so production and consumption must occur virtually simultaneously.

If customers do not see prices that reflect the relative scarcity of electricity at particular times, then they will do little to conserve during times of peak demand. Such behavior leads to two possible results: either brownouts and blackouts will occur at times of peak demand, or large investments in excess capacity will occur to ensure that there is always sufficient supply available to meet demand. Regulated monopoly has produced both types of results (though regulators and regulated firms alike tend to favor the latter whenever possible).

A significant benefit of retail competition is that creates more efficient price structures that reward customers for shifting their use of the service from peak to non-peak times. Cheap airfares to Europe in winter, free long-distance phone service on weekends, and lower transportation rates for backhauls are a few common examples. Similarly in electricity, retail competition could make some investments in new generation and transmission capacity unnecessary by shaving peak demand. Experimental evidence shows that required peak capacity is lower – and price spikes are much less severe—when buyers can make bids that reveal their willingness to reduce consumption in response to price increases. The investments in technology allowing customers to track and adjust electricity usage in real time may be much less costly than construction of new generation or transmission capacity.⁷

⁶ This has been an issue in Virginia, where the author is involved in a study of the State Corporation Commission's electric and gas restructuring initiatives. It has also been an issue in other states, as the RED Index surveys (described in Section IV.A. below) documents.

⁷ Stephen J. Rassenti, Vernon L. Smith, and Bart J. Wilson, "Demand-Side Bidding Will Control Market Power, and Decrease the Level and Volatility of Prices," Working Paper, Economic Science Laboratory, University of Arizona (February 2001).

III. LESSONS FROM OTHER INDUSTRIES

The Commission asks whether deregulation in other industries carries implications for electricity restructuring. In the late 1970s and early 1980s, five major U.S. industries with significant economic similarities to electricity experienced either full or partial deregulation: natural gas, long-distance telecommunications, airlines, railroads, and trucking. In all five industries, deregulation led to substantial price and non-price benefits for customers.

A. Price Effects

A Mercatus Center study revealed that, in each of these industries, within the first two years of deregulation, average inflation-adjusted prices had fallen by 4-15 percent, and sometimes more for some groups of customers.⁸ Within 10 years, prices were at least 25 percent lower, and sometimes close to 50 percent lower. (See Table 1.)

Table 1: Price Trends in the Years Following Deregulation

	2-year price reduction	5-year price reduction	10-year price reduction
Gas (interstate)	10-38% (1984-86)	23-45% (1984-89)	27-57% (1984-94)
Gas (retail, Georgia)	7-12% (1998-99)	N.A.	N.A.
Long-Distance Telecom	5-16% (1984-86)	23-41% (1984-89)	40-47% (1984-94)
Airlines	13% (1977-79)	12% (1977-82)	29% (1977-87)
Trucking	N.A.	3-17% (1980-85)	28-56% (1977-87)
Rail	4% (1980-82)	20% (1980-85)	44% (1980-90)

Note: The first year in parentheses is the year before deregulatory legislation or regulatory reform took effect.

Most customer classes paid lower prices in the years following deregulation—even residential or other small customers commonly thought to have less of an advantage in a competitive market. Highlights from the study include:

⁸ Robert Crandall and Jerry Ellig, *Economic Deregulation and Customer Choice: Lessons for the Electric Industry* (Mercatus Center, George Mason University, 1996). The study, attached as an appendix to this comment, describes these changes in greater detail.

Natural Gas. Adjusted for inflation, wellhead natural gas prices fell by 60 percent between 1984 and 1995. Prices paid by local utilities for gas at the “city gate” dropped by 52 percent. Residential and commercial customers saw their prices fall by 32 percent and 38 percent respectively. Industrial and electric utility customers both saw their gas costs fall by about 60 percent.⁹

Similar trends have occurred in response to more recent initiatives implementing retail competition in gas supply and marketing. For example, the state of Georgia moved to retail competition for all customers in 1998. Residential customers who switched received prices 7-12 percent lower than the regulated rates offered by Atlanta Gas Light Company, the state’s dominant gas utility.¹⁰

Telecommunications. In the 10 years following the AT&T breakup, real interstate long-distance rates fell by an average of 6 percent annually. Real intrastate long-distance rates fell less rapidly—by 5.3 percent annually—largely because states removed barriers to competition in this market less rapidly than the federal government opened up competition in interstate calling.¹¹ Residential as well as business customers received lower long-distance rates. Even the poorest Americans benefited, since long-distance service accounts for more than 40 percent of the average phone bill, even of households with incomes below \$10,000.¹² Consumer equipment prices also fell; the real price of standard corded telephones fell by 65 percent in the 10 years following the AT&T breakup, and the real price of answering machines fell by 34 percent.¹³ The AT&T breakup did nothing to introduce competition into local telephone service, and real local rates averaged about the same in 1994 as in 1984.¹⁴

Airlines. Ten years after deregulation, average real air fares were lower or unchanged even on routes served by a single carrier, low-density routes, and routes from hub airports served by a single carrier. Individuals tended to get larger fare reductions than businesses, since the biggest price cuts went to travelers who could be more flexible about their departure and arrival dates and times.¹⁵

Trucking. During the first 10 years of trucking deregulation, real rates for truckload shipments fell by 58 percent. Real rates for less-than-truckload shipments, which are more costly to handle, fell by 28 percent.¹⁶

Rail. Data from the Surface Transportation Board show that real rail rates for the five largest groups of commodities—coal, chemicals, intermodal, transportation equipment, and farm products—were all 17-44 percent lower ten years after deregulation. Shippers of coal and farm

⁹ Appendix, pp. 10-11.

¹⁰ George R. Hall, “Consumer Benefits from Deregulation of Retail Natural Gas Markets: Lessons from the Georgia Experience,” study prepared for AGL Resources, Inc., by PHB Hagler Bailly, Inc. (March 10, 2000).

¹¹ Appendix, pp. 23-24.

¹² Robert W. Crandall and Leonard Waverman, *Who Pays for Universal Service?* (Washington: Brookings Institution, 2000), p. 48.

¹³ Appendix, p. 26.

¹⁴ Appendix, p. 25.

¹⁵ Appendix, pp. 34-39.

¹⁶ Appendix, p. 49.

products are more likely to be served by only one railroad and have few other good transportation alternatives. Nevertheless, real coal rates fell by at least 25 percent over ten years, and real rates for farm products fell by at least 38 percent.¹⁷

The fact that lower prices followed deregulation does not necessarily mean that deregulation caused the price reductions. To assess the effect of competition more accurately, one must control for other factors that could have influenced prices. Studies controlling for other factors reveal that billions of dollars worth of price reductions can be directly attributed to deregulation.

Table 2 summarizes the effect of deregulation on prices over various time periods. Deregulation reduced prices by between 3 percent and 50 percent, depending on the industry and time period studied. Most estimates are in the 10-25 percent range.

Table 2: Price Reductions Occurring as a Result of Deregulation

Industry	Time Period Studied	Real Price Reduction Due to Deregulation
Gas, retail (Georgia)	1998-99	7-12 percent
Long-distance telephone	1985-86	26 percent
	1985-87	42 percent
	1985-93	7.6 percent annual average
Airlines	1977-79	8-25 percent
	1977-82	28 percent
	1977-93	19 percent
Trucking	1980-85	3 percent (LTL)
		17 percent (TL)
Rail	1980-84	5 percent
	1980-85	3 percent
	1980-87	16-19 percent
	1980-88	30 percent

Sources: Hall, "Consumer Benefits from Deregulation;" Ellig, "Railroad Deregulation and Consumer Welfare," *Journal of Regulatory Economics*, forthcoming; Crandall & Ellig (Appendix).

B. Nonprice Effects

As important and substantial as the price reductions attributable to competition are, the non-price effects are just as, if not more, important. As noted above, deregulation in network industries has unleashed waves of entrepreneurial creativity that cut costs, improved service quality, and led to

¹⁷ Calculated from data in Surface Transportation Board, Office of Economics, Environmental Analysis, and Administration, "Rail Rates Continue Multi-Year Decline" (February 1998).

the introduction of new products and services. Such improvements, though harder to predict accurately in advance, were nevertheless substantial.

In summary, the more substantial non-price effects in the five deregulated industries include:

Natural gas. In the interstate natural gas industry, deregulated pricing and open access brought major innovations on both the physical and financial sides. Gas pipelines have interconnected at a series of “market hubs” that allow individual shippers to receive gas from a much larger number of suppliers and effectively increase competition faced by individual pipelines. The industry has also seen a huge increase in the use of financial transactions that allow suppliers, shippers, and customers to hedge price risks. Free-market prices convey accurate signals about the value of gas, and a free market in hedging transactions lets parties understand the costs and benefits of insuring against adverse price swings.¹⁸

In Georgia’s competitive retail gas market, individual customers can choose from many different price plans to fit their own risk tolerances, including variable price and multi-year fixed price options. Marketers offered a variety of new payment options, including electronic drafts, credit card payment, or payment at local supermarkets. One placed kiosks in supermarkets to educate consumers about retail competition and publicly renounced telemarketing. Many gas marketers plan to expand their offerings to include telephone service, Internet access, home security, energy management, and appliance sales and service.¹⁹

Telecommunications. The introduction of competition in long-distance and telephone equipment accelerated the deployment of fiber optic cable and digital switching.²⁰ It is also highly likely that competition in customer equipment hastened the introduction of innovations like answering machines, fax machines, cordless phones, and other types of equipment found in many homes. As an equipment monopolist, AT&T strenuously fought the introduction of any customer premises equipment not produced by Western Electric, AT&T’s manufacturing division.²¹ Opening the equipment market to competition allowed many different competitors to offer different types of equipment and pursue different marketing strategies.

Airlines. Deregulation facilitated at least three major innovations that cut costs and increased flight frequency: (1) the hub-and-spoke routing systems adopted by most major airlines, (2) low-cost airlines (such as Southwest, Spirit, and others), and (3) short-distance commuter airlines. One study pegged the value to passengers of increased flight frequency at \$10.3 billion annually (in 1993 dollars). Passengers strongly prefer to remain on the same airline when they change planes, and the creation of national route networks facilitated by the hub-and spoke system means that the percentage of passengers changing airlines has fallen from 14 percent in 1978 to 1 percent today.²²

¹⁸ Appendix, pp. 15-16.

¹⁹ Hall, “Consumer Benefits from Deregulation,” pp. 16-22.

²⁰ Appendix, p. 29.

²¹ Robert W. Crandall, *After the Breakup: U.S. Telecommunications in a More Competitive Era* (Washington: Brookings Institution, 1991), pp. 33-34.

²² Appendix, pp. 40-44.

Trucking. Increased competition created incentives to improve service quality and invest in sophisticated shipment tracking and monitoring technology. By 1985, shippers saved nearly \$1 billion annually in reduced costs due to more reliable service. The combination of rail and trucking deregulation also permitted an expansion of intermodal service, which cuts costs and, in some cases, improves delivery times.²³

Rail. Deregulation facilitated service quality improvements, largely by making it attractive for railroads to invest in maintaining worn-out track and equipment. Service improvements have made shippers better off by between \$5 billion and \$10 billion annually.²⁴

Where analysts estimate a monetary value for new or improved services, the figures are surprisingly large. For airlines and railroads, the value of new and improved service is almost as large as the value of the price reductions! The figure for trucking is more modest, but still substantial. Clearly, competition generates important benefits in addition to price reductions. Given this experience, it would not be surprising if retail electric competition created nonprice benefits worth at least as much to customers as the price benefits.

IV. RETAIL ELECTRIC COMPETITION IN PRACTICE

As the Commission notes, the various states are in different stages of retail electric restructuring. Although it is too early to identify definitive results in most states, we would like to bring to the Commission's attention a useful data source that facilitates nationwide comparison of states' electric restructuring plans. In addition, we believe it is instructive to compare the restructuring experiences in California and Pennsylvania, two early leaders that have had quite different levels of success in promoting effective competition.

A. Nationwide comparison—the RED Index

The Commission has solicited highly detailed information on the various states' electricity restructuring programs. Fortunately, a comprehensive source of such information already exists and is updated annually. The Center for the Advancement of Energy Markets (CAEM) has developed the Retail Energy Deregulation Index, a list of 22 attributes that measure the extent to which each state has put in place policies that will lead to a workably competitive retail electricity market. CAEM surveys state public utility commissions to ascertain their progress on each attribute and synthesizes the results into a ranking that allows each state to see where it compares nationally. Scholars affiliated with the Mercatus Center and George Mason University have found CAEM's data extremely helpful, and we recommend that the Commission make use of this unique information source to answer many of the questions posed in the announcement of the Commission's study of retail electricity competition.²⁵

²³ Appendix, p. 52.

²⁴ Appendix, p. 49.

²⁵ CAEM's RED Index report is available free of charge to the public sector at www.caem.org.

B. California vs. Pennsylvania

California has, of course, received enormous publicity as an alleged example of the “failure” of electric restructuring. Pennsylvania has received much less attention—which is unfortunate, because Pennsylvania is electric restructuring’s shining success story.

1. California

California has a reputation for being the first state to deregulate its electric market, but California’s plan suffered from several significant flaws. Until late 2000, utilities had to purchase all of their power through a state-mandated, centralized Power Exchange. They could not make bilateral deals with individual generators, which would let them avoid inefficiencies or “gaming” made possible by poorly-designed Power Exchange rules. They could sign long-term contracts for power with individual generators, which might help mitigate price fluctuations. On the retail level, competition is distorted by mandated rate cuts, mandated rate freezes, and an accelerated stranded cost recovery schedule. These three factors have essentially prevented the development of competition in the retail market for residential and small business customers.

California ranks surprisingly low in an independent assessment of the openness of state electricity markets. The state ranks only 13th on the Center for the Advancement of Energy Markets RED Index, despite the fact that California was the first state to enact restructuring legislation. Many of the other states that restructured relatively early rank near the top, including (1) Pennsylvania, (2) New York, and (3) Maine. Even jurisdictions that acted more recently, such as Arizona (1998), Maryland (1999), New Jersey (1999), and the District of Columbia (2000) outrank California. Given this ranking, it should come as no surprise that California’s deregulation effort has been plagued by problems and has resulted in relatively little customer switching in the residential market.²⁶

California’s much-publicized power crisis has actually occurred due to forces largely separate from electric restructuring. Electricity demand in California has risen by 25 percent during the past eight years, but generating capacity has increased by only 6 percent.²⁷ No new power plants have been built in California for 12 years. After California’s restructuring legislation was enacted in 1996, several companies applied for permission to build new power plants, but not one had been approved by the summer of 2000.²⁸ The state’s permitting process for power plants takes three times as long as in Texas. California’s largest independent power producer plans to build a plant on an Indian reservation so it will only have to deal with federal regulations.²⁹

²⁶ Of course, lack of customer switching does not necessarily indicate that the market is uncompetitive. Even in a fully competitive system, the vast majority of customers might choose to take service from their familiar old utility, or its marketing affiliate, if they perceive the utility to offer the best deal. But the structural analysis underlying the RED Index suggests that the lack of switching in California is due to a poorly-designed market.

²⁷ William P. Kucewicz, “Too Much Regulation Keeps California in the Dark,” *Wall Street Journal* (August 7, 2000).

²⁸ Adrian Moore, “San Diego’s Politically Driven Deregulation,” *San Diego Union* (August 24, 2000).

²⁹ Chris Kraul and Nancy Rivera Brooks, “Officials Go from Cold to Hot on Power Projects,” *Los Angeles Times* (Sept. 4, 2000), p. A-1.

Investors who purchased the utilities' divested power plants at a premium foresaw this imbalance, which is why they were willing to pay such high prices for power plants that some people speculated would lose a lot of their value once competition arrived. The market price of power clearly indicates that additional capacity is needed, but no significant new power plants or transmission facilities have been built in California for more than a decade. In the meantime, the state's economy has boomed, boosting demand. Since the price spikes occurred after California claimed to deregulate the retail market, deregulation gets blamed for the price increases.

It is instructive to consider how California's utilities would have dealt with the supply-demand imbalance in the absence of restructuring. Instead of paying market prices for power to the owners of divested power plants, the utilities would still own the plants. But under old-fashioned monopoly regulation, neither the utilities' plants nor the independently-owned power plants would be capable of generating any more power than they currently generate under a less regulated system. At peak periods, the supply-demand imbalance would still exist. Regulators and utilities would face the same choice they face under today's system: allow retail prices to increase to cut back demand, or ration electricity through blackouts, brownouts, and mandatory consumption curtailments for large users. As Robert Michaels, an economist at California State University, Fullerton, noted, "This is reality, and markets force people to face it in ways that politicians live to help them avoid. Things are tight all over the West, there isn't much demand flexibility, new plants are taking forever to arrive, and the simple choice is between high prices and shortages."³⁰

2. Pennsylvania

Pennsylvania probably provides the best example of successful electric restructuring. Since its retail competition program was enacted, more than 500,000 Pennsylvania customers have switched electricity suppliers. More than 444,000 of these are residential customers.³¹ In addition, Pennsylvania ranks first in the RED Index, which suggests that it has done a good job of creating an environment conducive to competition.

More residential customers have switched suppliers in Pennsylvania than in all other states combined. Approximately 20 percent of Pennsylvania's customers have switched, compared to 2 percent for California.

Entry of new supply is also easier in Pennsylvania than in California. In the Pennsylvania-New Jersey-Maryland Power Pool, 1,000 mw of new generation were built in 2000, and the power pool expects an additional 15,000 mw to come on-line by 2005.³²

The Pennsylvania Department of Revenue projects that average electricity prices in Pennsylvania will be 16.9 percent lower in 2004 than they would be if regulation had continued. Prices will be 14.6 percent lower for residential customers, 18.8 percent lower for commercial customers, and

³⁰ Michaels, "Give Peace a Chance," p. 5.

³¹ Statistics available from Web site of the Pennsylvania Office of Consumer Advocate.

³² John Hanger, "On the Watch for Icebergs: Navigating the Commonwealth's Electricity Future," Citizens for Pennsylvania's Future (August 29, 2000), p. 2.

17.9 percent lower for industrial customers. The Pennsylvania Public Utility Commission estimates that competition saved electricity customers \$750 million in 1999.³³

3. California vs. Pennsylvania

A key factor affecting the success of competition is the extent to which state policies distort price relationships from those that would exist in a truly competitive market. A comparison of retail competition in California vs. Pennsylvania illustrates how price distortions can undermine competition.

In California, the state's "deregulation" legislation ordered utilities to give residential and small commercial customers a 10 percent rate cut. As a result, residential customers received a rate cut even if they made no effort to learn about competitive offers or switch to a new power supplier. The value of this "gift" becomes even greater when one considers that as long as the rate cut is in effect, residential customers who stick with their utility are also protected from increases in the market price of power.³⁴ The recovery period for utilities' stranded costs was also accelerated, so that utilities received the opportunity to recover these costs over four years. Customers who switch suppliers must still pay these costs—a fact that further diminishes their incentive to shop around.

Pennsylvania, on the other hand, adopted smaller rate cuts whose size and length were negotiated on a utility-by-utility basis. Customers who choose alternative suppliers receive a "shopping credit" representing the amount per kwh that they no longer have to pay for electricity they are no longer purchasing from the utility.³⁵ The shopping credit is always less than the utility's unbundled generation rate, so customers who switch still make a contribution to cover stranded costs. The recovery period for these investments will be approximately 10 years, which regulators believe is closer to the useful life of the assets.³⁶ These policies effectively mean that the price paid by Pennsylvania customers who switch suppliers is closer to the true, free-market price than the price paid by customers who switch in California.

Residential customers in Pennsylvania can achieve savings of 13-29 percent by opting for competitive suppliers. Before the current power crisis, California customers could save 5-6 percent at most. (See Table 3.) Almost all of the alternative suppliers available to California residential customers sell various forms of renewable energy that are sometimes more expensive than power offered by the utilities. Such suppliers are competitive only because renewable

³³ Pennsylvania Department of Revenue, *Electricity Generation, Customer Choice, and Competition: A Report to Governor Ridge and the General Assembly* (August 1, 2000), pp. E-5 and 2.

³⁴ As a result, the only California residential customers who initially paid higher prices because of the price spikes were those served by San Diego Gas & Electric, which was not subject to rate caps in the summer of 2000 because it had recovered all of its stranded costs.

³⁵ "Shopping credit" is an unfortunate term, because it implies that customers who switch suppliers are receiving some type of subsidy. In reality, the shopping credit simply means that consumers do not have to pay the utility for electricity if they decide to buy their electricity from someone else.

³⁶ 10-year figure is from Comment of the Staff of the Bureau of Economic Policy of the Federal Trade Commission before the Arkansas Public Service Commission in Docket No. 00-148-R (July 6, 2000), p. 2. Regulators' assessment of the useful life of the assets is from author's conversation with former Pennsylvania PUC Commissioner John Hanger.

power is heavily subsidized in California and because some customers are willing to pay a premium for “green” power.

California’s policies significantly distort price relationships in ways that reduce the customer’s benefit from switching power suppliers, and thus they discourage alternative suppliers from competing in the residential market. Pennsylvania’s policies involve much less distortion. California’s mandated price cuts are larger, and so are the charges for stranded costs that customers cannot escape when they switch suppliers.

Table 3: Competitive Options in California vs. Pennsylvania (Pre-CA Power Crisis)

(Utilities are italicized.)

CALIFORNIA			PENNSYLVANIA		
	Sample bill, 500 kwh	Maximum % Savings		Sample bill, 500 kwh	Maximum % Savings
<i>PG&E</i>	<i>\$54.89</i>		<i>Allegheny Power</i>	<i>\$16.22</i>	
Competitors, standard	\$54.66-57.14	0.4	Competitors, standard	\$12.97	20
Competitors, Renewable	\$51.89-66.89	5.5	Competitors, renewable	\$29.95-36.40	No savings
<i>SCE</i>	<i>\$59.32</i>		<i>Duquesne</i>	<i>\$24.00</i>	
Competitors, standard	\$61.57	No savings	Competitors, standard	\$19.20-\$23.00	20
Competitors, Renewable	\$56.32-\$71.32	5.0	Competitors, renewable	\$30.45-36.40	No savings
<i>SDG&E</i>	<i>\$49.10</i>		<i>GPU Energy – Met Ed</i>	<i>\$22.63</i>	
Competitors, standard	\$51.35	No savings	Competitors, standard	\$18.10-\$26.75	20
Competitors, renewable	\$46.10-\$61.10	6.1	Competitors, renewable	\$31.45-39.40	No savings
			<i>GPU Energy – Penelec</i>	<i>\$22.64</i>	

			Competitors, standard	\$18.11- 26.75	20
			Competitors, renewable	\$31.45- 39.40	No savings
			<i>PECO Energy</i>	<i>\$27.75</i>	
			Competitors, standard	\$22.60- \$27.90	18.6
			Competitors, renewable	\$24.00- 39.40	13.5
			<i>Penn Power</i>	<i>\$27.42</i>	
			Competitors, standard	\$19.36- \$30.50	29
			Competitors, renewable	\$29.95- \$36.40	No savings
			<i>PPL Utilities</i>	<i>\$24.28</i>	
			Competitors, standard	\$18.52- \$25.65	24
			Competitors, renewable	\$31.35- \$39.40	No savings
			<i>UGI</i>	<i>\$21.58</i>	
			Competitors, standard	\$17.27- \$23.25	20
			Competitors, renewable	\$31.45- \$39.40	No savings

Sources: California Office of Ratepayer Advocates Shopper's Guide for Residential and Small Commercial Customers (March 1, 2000); Pennsylvania Office of Consumer Advocate Price Comparison Charts (July 31, 2000).

V. CONCLUSION

The Commission's study of the effects of retail competition in the electric industry is timely and appropriate. We offer the following observations in the hope of maximizing the study's relevance and effectiveness:

1. Deregulation often generates price reductions both by curbing market power and by improving incentives for innovation. The potential for innovation implies that a deregulated market may experience lower prices even if substantial market power remains.
2. If regulation holds prices below competitive market levels, then deregulation can simultaneously raise prices and increase consumer welfare.
3. For most of this century, our society has been wedded to the idea that everyone (except big businesses) should have the right to buy as much electricity as he or she wants at a fixed, regulated retail price. Inelastic retail demand—which exacerbates wholesale price spikes—may simply be an artifact of regulation. A sound restructuring plan would allow customers to face retail prices that more closely reflect the varying cost of producing it at different times of the day.
4. Experience in other industries shows that deregulation typically produces large price reductions, as well as nonprice benefits whose magnitude can exceed that of the price benefits.
5. The Retail Energy Deregulation Index produced by the Center for Advancement of Energy Markets provides useful data on the details of electric restructuring programs in all states.
6. A comparison of California's and Pennsylvania's experiences with electricity restructuring suggests that competition can indeed produce substantial benefits, but a poorly-designed restructuring plan can prevent competition from emerging.

Statement of **Vernon L. Smith**, Ph.D.
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submitted to the

U.S. Senate Committee on Government Affairs
340 Dirksen Senate Office Building
Washington, D.C. 20510

June 20, 2001

Dear Senator Thompson. Thank you for the opportunity to submit comments into the record on the committee's forthcoming hearing *The Role of the Federal Energy Regulatory Commission Associated with the Restructuring of Energy Industries*. I am currently the Regent's Professor of Economics and Director of the University of Arizona's Economic Science Laboratory. As you may know, later next month my colleagues and I will be moving to Northern Virginia to become affiliated with George Mason University and its Mercatus Center. This statement is based largely on my joint work with Stephen Rassenti and Bart Wilson, also with the Economic Science Laboratory.

BACKGROUND OF THE CRISIS

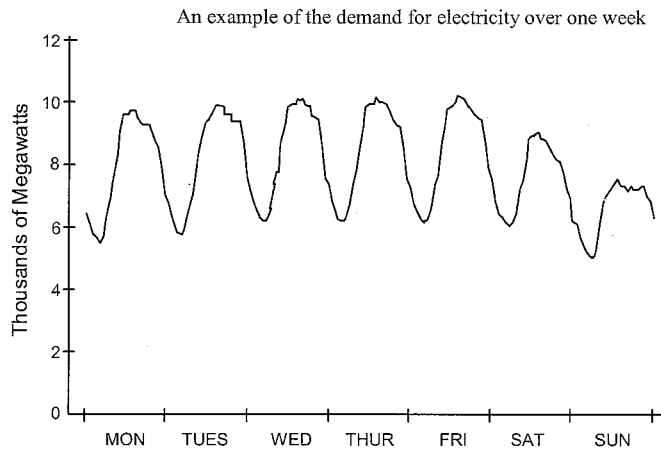
The California energy crisis neither started in California nor was it special to California. The sharp increases in electricity prices (price spikes) in the hourly spot market began in the Midwest and parts of the East Coast in the summer of 1998, and were repeated in the summers of 1999, 2000 and are likely to be repeated again in the summer of 2001. Well before the California crisis these earlier spike prices reached levels of \$2 to \$3 per kilowatt-hour and higher (the highest, according to FERC was a transaction at \$7.50 per kilowatt hour). For comparison, the average retail price is only about \$0.10 to \$0.12 per kilowatt-hour. These price increases have

had the effect of attracting increased capacity, which will moderate future price increases to a degree that is not predictable. The difference with California is only that the earlier price spikes were temporary. As in California, however, they were absorbed in the form of losses by wholesale buyers who did not pass on the increase to their end use customers, and therefore did not provide needed incentives for conservation. Hence, price spikes in California were predictable and expected by anyone who was informed of this history. Temporary shortages can be expected in any electrical market, anywhere. It is therefore essential that the market be designed to encourage demand responsiveness to price on the part of all end use customers whose circumstances do not require an uninterruptible supply of power at all times of the day, week or season. This demand responsiveness, sufficient to prevent price spikes does not have to be a large percentage of peak demand. My coworkers (Stephen Rassenti and Bart Wilson) and I have studied laboratory market experiments in which wholesale buyers who participate as demand side bidders in the spot market can interrupt 16% of peak demand. Compared with control experiments where the market is organized as a one-sided seller bid market only, as in California and elsewhere, price spikes are eliminated, average prices are greatly reduced, and price volatility is very modest.

HOW ENERGY MARKETS OPERATE

The normal consumption of electricity undergoes a cycle each day beginning in the off-peak hours in the early morning, increasing in the late morning, reaching a peak in the hours of 1-4 pm in the afternoon then decreasing in the late afternoon and evening. From off-peak to on peak, consumption can easily increase by a factor of two or more, as illustrated below in Figure 1.

Figure 1.
Actual Weekly Load Curve

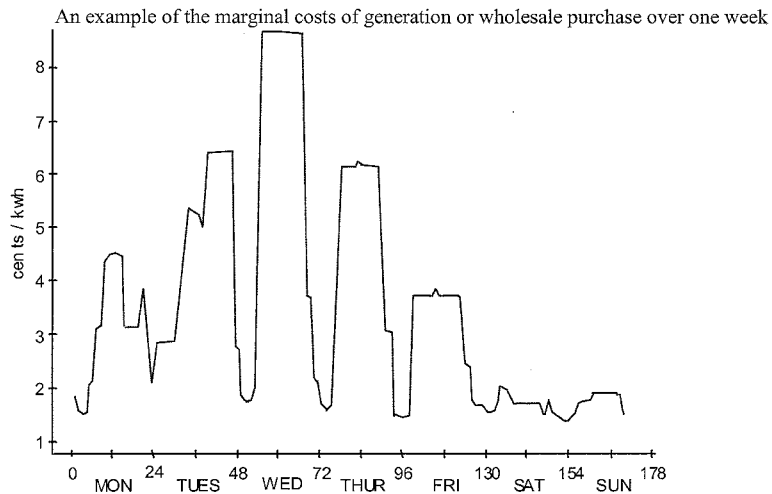


Adapted from: Power Technologies, Inc., "Technical Background and Considerations in Proposed Increased Wheeling, Transmission Access and Non-Utility Generation," contractor report prepared for the Office of Technology Assessment, March 1988, pp 2 - 3

This cycle in consumption is supplied by three types of generators: (1) low cost, base load capacity units that produce at a steady hourly rate; (2) intermediate cost, load-following generator capacity units that are able to ramp up their output as consumption increases from the low off-peak hour levels, and down from the peak hours; (3) high cost, peaking capacity generators that are only turned on for the peak consumption hours.

The marginal cost of energy supply alone during the peak hours of consumption can easily be six or more times the corresponding cost for off-peak consumption. This is shown in Figure 2 for a typical hot August week in the 1980s.

Figure 2.
Actual System Lambda



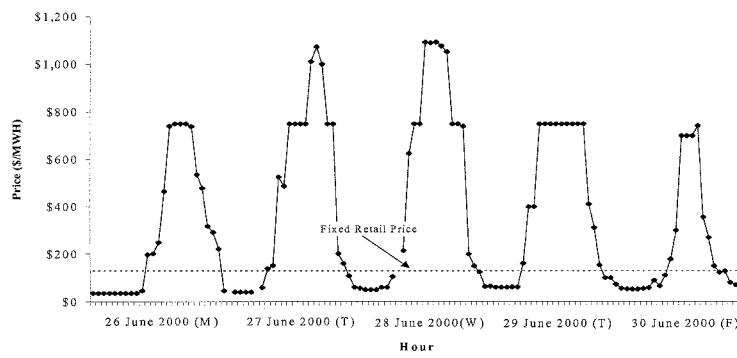
Adapted from: Bohn, R., Caramanis, M. and Scheppe, F., "Optimal Pricing in Electrical Networks over Time and Space", *Rand Journal of Economics*, 1984, 15:3, pp 360 - 376

Market efficiency, however, requires the capital investment cost of peaking generators and peak transmission capacity to be charged only to the peak end users, whose demand requires such investments. Hence, the on-peak energy and capital costs could easily be estimated to be ten or more times the off-peak costs.

As expected and as desired, the California market price cycles reflected this pattern of large fluctuations in wholesale cost over the daily cycle. But in days and weeks of extreme shortage (for example low reservoirs of water in the Northwest) the price cycle also became very extreme. In one particular week (26-30 June 2000) the price spikes reached as high as \$1100 per megawatt hour or \$1.10 per kilowatt-hour. This week of hourly prices is shown in Figure 3.

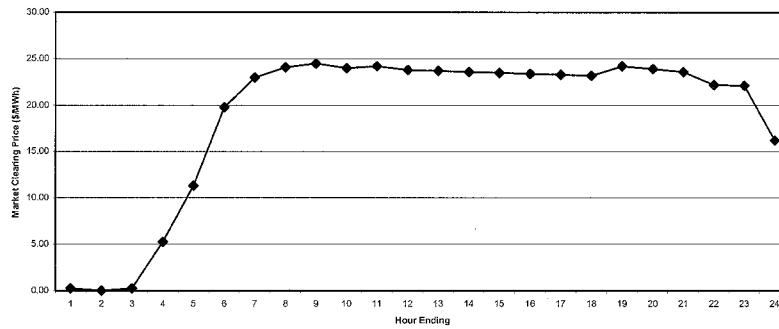
Distribution companies who purchase in this market resell the power at a fixed hourly price of about \$130 per MWH. As a consequence these utilities have lost some \$8-9 billion dollars according to some media reports. It is called buying high and selling low and is not a good business strategy, and it is not in the long run interest of either consumers or suppliers.

Figure 3. California PX Prices



But prices have not always been so volatile in California. Thus, on April 1, 1998, prices ranged from a low of zero at 2 am to almost \$25 per MWH (2.5 cents per KWH). The hourly pattern throughout that day is shown in Figure 4. Note that a price of zero did not attract media attention, nor did it invite claims of “market failure.”

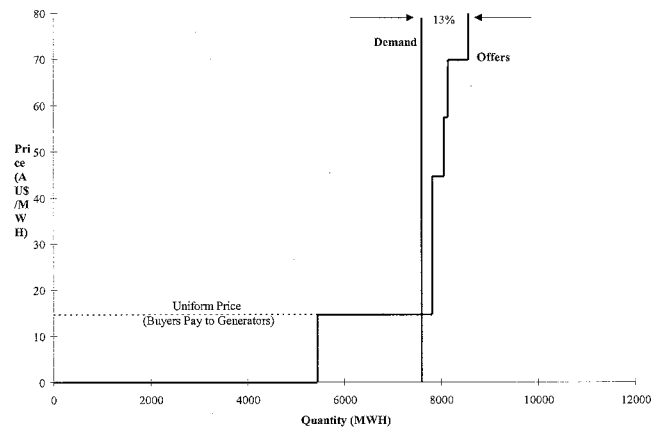
**Figure 4. Unconstrained Market Prices
California PX, April 1, 1998**



To illustrate the problem of price spikes, and how they occur, Figure 5 shows the generator supply bids for power in the Australian spot market for which we have complete data on a particular hour back in 1996 near the beginning of the Australian market. In this real live example most (up to 5500 MWH) bids to supply energy were at a price of zero. These zero bids are from baseload generators offering to sell at any price they can fetch. Then there is a supply step offering an additional 2400 MWH at about \$15 per MWH. These are the load following generators. Next, there are small additional increments of power offered at \$45, \$56 and \$71 per MWH. Consumption demand is about 7600 MWH yielding a spot price of \$15, as indicated, which is received by all generators who bid at this price or less up to the total demanded. Note, however, that if demand had been 8000 MWH the price would be \$45; at 8200 MWH the price \$56; at 8600 MWH the price would be \$71. Hence, small changes in consumption produce large leaps in price. Indeed, only a 13% increase from 7600 to 8600 would have cause price to increase by 273%. Finally, note that the price would have been zero if demand has been 5000

MWH. This sensitivity to large changes in price for small changes in demand explains the price spikes in California and earlier in the Midwest and East.

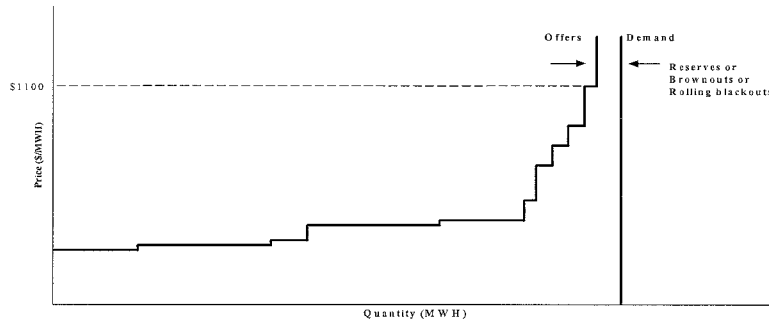
Figure 5. Price Determination in the Australian Electricity Market



Source: This graph is drawn from Hugh Outhred's presentation entitled, "Australia: Spot Trading Results and Implications for Ancillary Services," 5 January 2000. The data are for the 17 May 1996, targeting 20:00.

So what happened in California to bring the higher price level and extreme price spikes shown in Figure 3, along with occasional blackouts? Very simply, the demand was at or above the highest price supply units offered to the market. The shortfall in supply, as shown in Figure 6, was provided from (1) emergency reserves; (2) brownouts (reduced power causing lights to dim); or (3) rolling blackouts.

Figure 6. Illustration of a “Shortage” and Price Determination on the CAL PX on Peak



CAUSES OF THE CRISES

The primary rationale for deregulation is to allow the time variation in wholesale cost to be reflected in corresponding time variable prices paid by bulk buyers and received by generator sellers. This should provide incentive signals to consumers as to where and when to conserve, and to suppliers as to what forms of investment are most profitable and efficient. What has been missing are the needed market and metering mechanisms for passing wholesale price variations through to the end user. Hence, the root cause of the crisis in California and the high temporary price spikes elsewhere, has been the failure in spot market design to

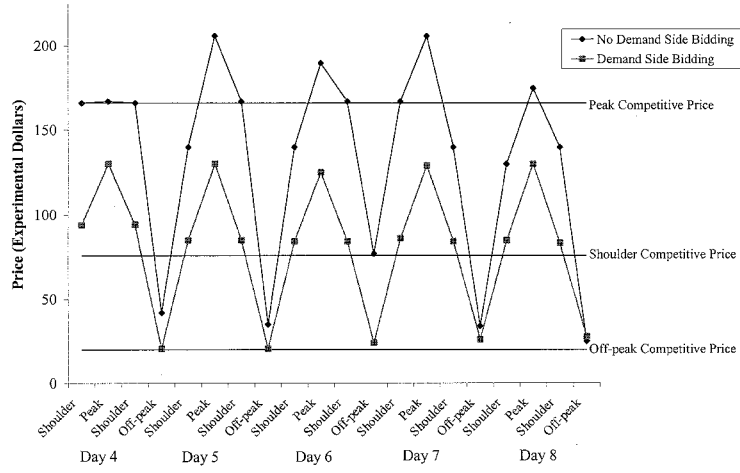
1. encourage and make explicit provision for strategic demand side bidding by wholesale buyers,
2. implement such provision by introducing time-of-day pricing at the end user's consumption points, and
3. invest in the required control switching technology for selective, voluntary reduction of the lower priority uses of electricity during peak hours. This can

be accomplished directly by the end user who invests in a load management system. It can also be provided by contractual agreements between the utility and the consumer allowing the utility to shut off selected appliances or circuits (washers, dryers, air conditioning, etc.) for limited times. In this case the utility (or a competing supplier) manages a rolling blackout of only those lower consumption priorities approved by the customer.

EFFECTIVENESS OF DEMAND RESPONSIVE PRICING TO THE END USE CONSUMER

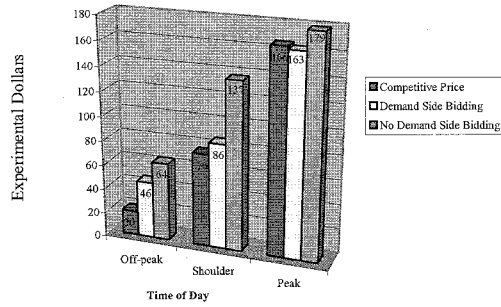
Based on our laboratory research we can compare prices over a daily cycle (for simplicity, consisting of six 4-hour block pricing periods in each experimental 'day') as shown in Figure 7. In the experiments, because the experimenter controls buyer value and seller costs we can identify competitive equilibrium prices on the 'shoulder' demands (between off and on peak), on-peak demand and off-peak demand. In the experiments, demand cycled each 'day' from a shoulder period to peak, back to a shoulder, and finally to off-peak. This cycle was then repeated. In Figure 7 we show the data for 'days' 4 through 8 for a particular week in one experiment. The price in every comparison period of each 'day' is lower with price responsive demand side bidding than when there is no demand responsiveness.

Figure 7. An Example of the Effect of a Responsive Demand



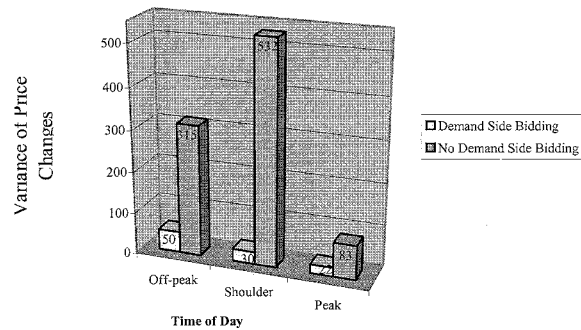
On average across all experiments prices are lower with demand side price response than without, as shown in Figure 8.

Figure 8. Average Prices



Finally, the volatility of prices, or variations in price changes from period to period is very low by comparison when demand is price responsive. This is shown in Figure 9.

Figure 9. Variance of Changes in Price from Day to Day



SUMMARY

1. With only 16% of peak demand interruptible to end users, our experiments suggest that retail time-of-day prices can be substantially lowered, and price spikes eliminated.
2. Such interruption can be entirely voluntary with consumers finding it in their interest to consume less on peak in order to capture the savings from time-of-day retail pricing. In currently structured markets elevators carrying passengers have the same high priority as porch lights left on in the daytime, and constitutes a highly irrationally structured market.
3. by rolling selective voluntary power interruptions, blackouts of whole neighborhoods can be avoided, except under extreme weather conditions when they are unavoidable.

4. The California crisis is a direct consequence of a failure to introduce time-of-day retail prices that reflect highly variable time-of-day wholesale prices, and generator costs.
5. What must change is the cultural mindset of local utility managers and their customers which has been inherited from state regulation. This mind set is that all retail demand must be served without regard to the differences in individual consumer's willingness-to-pay for energy. This mind set will change with full-cost time-of-day pricing, which will have the effect of incentivizing customers to prioritize their use of energy, making demand voluntarily responsive to prices.
6. The effect of these changes will be to create a far more efficient and smoothly functioning market that will not require government intervention. It will enormously benefit the environment by reducing the growth in demand for energy and transmission capacity, and thereby reducing air pollution and unsightly power lines.

Again, thank you, Senator Thompson, for letting me prepare this statement. I trust it will be helpful as you wrestle with the policy implications of the current situation in California.

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JOHN M. QUAIN
CHAIRMAN

June 20, 2001

TELEPHONE
(717) 783-7349

Senator Fred Thompson
Ranking Member
Committee on Government Affairs
340 Dirksen Senate Office Building
Washington, DC 20510

Re: Committee hearing of June 20, 2001

Dear Senator Thompson:

It is with sincere apologies that I must decline the invitation to appear before the Committee tomorrow morning. I very much regret the fact that my own affairs are so involved at this time, but as you may know I am stepping down as Chairman of the Pennsylvania Public Utility Commission this Thursday. In order to achieve the orderly transition I committed to our Governor to accomplish, my presence here is required.

That being said, I would like to offer some thoughts on the basis of Pennsylvania's restructuring program as to why our experience has been different from California's. Please understand that these comments should not be misconstrued as a criticism of the participants in the California restructuring effort. However, California's difficulties should not be allowed to derail the progress that has been made and which is going forward nationally in restructuring the electric industry and promoting competitive markets.

Both programs tried to reach the same goal of customer choice and electric generation competition. However, there are many differences between our two restructuring efforts and the consequences of those efforts. Let me list some of the most fundamental differences:

- Pennsylvania's restructuring law and its implementation were based on collaborative efforts by all participants. California attempted to restructure its electric industry on the basis of theories that not all participants agreed with or even agreed to abide by.
- Pennsylvania started competition with a generation surplus and an adequate, reliable transmission infrastructure, conditions that prevail to this day. Pennsylvania is a net exporter of power. California began competition with a looming

generation deficit and some serious regional transmission line issues. California is a net importer of power and will continue to be an importer for the foreseeable future.

- Pennsylvania is seeing generation added in excess of projected growth of demand. Due to environmental and land use restrictions, complicated and extended plant-siting reviews and improper price signals, California is not creating an atmosphere that allows for substantial generation expansion. Placing additional generation beyond the borders of the state only serves to further constrain import capacity on the western transmission system.

- PJM wholesale market rules are well-defined, based on a transparent market. The PJM power pool is the oldest, most experienced centrally dispatched power pool in the United States. The CAL-ISO was created as a result of the California restructuring legislation.

- Pennsylvania's utilities had the option of retaining their generation in an affiliate company or of selling that generation. California's utilities were required to sell a large portion of their generation assets and encouraged to sell *all* generation assets in the expectation that competition would emerge. When that did not happen, the utilities were compelled to purchase high-priced power at the spot market price.

- Pennsylvania market participants may choose to buy from the spot market or enter into long-term contracts. California utilities had to sell into and buy from the spot market. Market participants are much more severely limited in terms of contractual arrangements, and California utilities as providers of last resort were compelled to purchase from the spot market instead of entering into long-term contracts.

- Pennsylvania planned for a phase-in of competition and a gradual transition to customer choice. That phase-in was extended, in many cases, as the result of utility restructuring settlement agreements. In California, the abrupt removal of rate caps in San Diego presaged an uncontrolled price spiral.

Pennsylvania's restructuring program and the development of competition has been the beneficiary of ongoing stewardship and careful monitoring by the Public Utility Commission, the Office of Consumer Advocate, the Office of Small Business Advocate, by our General Assembly, and by the active participation of all parties with a stake in the competitive markets. Ongoing oversight must maintain the delicate balance that prevents government intrusion while avoiding government indifference. We want reliability maintained. We want energy markets to work. To achieve those goals, we know that we must be vigilant.

In conclusion, Pennsylvania's utility industry is strong. Our customer choice programs have been a success and are rightly pointed to, nationally and even internationally, as models. Through the collaborative process, considered legislation, careful implementation and ongoing stewardship, I am confident that we have avoided and will continue to avoid many of the problems that have beset other states.

I thank you for the opportunity to make these comments, and I apologize for not being able to attend the Committee meeting.

Sincerely,



John M. Quain, Chairman
Pennsylvania Public Utility
Commission

788



GOVERNOR GRAY DAVIS

October 9, 2001

The Honorable Fred Thompson
United States Senate
Committee on Governmental Affairs
Washington, DC 20510

Dear Senator Thompson:

Thank you for the opportunity to clarify several issues related to the energy situation in California. Attached please find my responses to your questions, which you asked to be included in the record.

I appreciate the concern the Committee on Governmental Affairs has expressed for the challenges facing California, and I would be happy to answer any further questions you or your colleagues may have.

Sincerely,


GRAY DAVIS

CC: Chairman Joseph Lieberman

**QUESTIONS FOR THE RECORD FOR GOVERNOR GRAY DAVIS,
FROM SENATOR FRED THOMPSON**

1. In your testimony before the Governmental Affairs Committee on June 20, you stated that "It is unconscionable that the [Federal Energy Regulatory] Commission look the other way while energy companies bilk Californians out of \$9 billion."

a. Serious questions have been raised regarding the accuracy of the \$9 billion figure. For example, the Los Angeles Times reported on June 22 that the figures were based on "shaky calculations" and that internal documents from the California Independent System Operator ("Cal-ISO") "warn that some of the financial assumptions used to quantify the alleged excess profits could be well off the mark." We understand that the Cal-ISO documents caution against relying on the agency's study as a basis for allegations of overcharging.

- i. Were you aware of a Cal-ISO warning that the figures were questionable?**
- ii. If yes, what was your reasoning in using the figures as the basis for claims of price gouging?**
- iii. Do you stand by the \$9 billion figure? If so, why?**

The Cal-ISO has noted that these figures were the result of comparing prices charged with a calculation of a fully competitive market and as such were a measure of the cost of market power, but did not necessarily represent an established method of calculating appropriate refunds. The Cal-ISO indicated that the FERC might properly require a showing of the actual production costs by seller, which could produce refunds in amounts larger than those identified as excess charges in the report. Subsequently, the FERC adopted a modified version of the ISO's benchmark methodology in deciding how mitigated prices would be calculated. Several of the FERC modifications tend to lessen the effect of mitigation and the State has sought rehearing of these.

b. It is our understanding that many entities not subject to FERC jurisdiction may have overcharged California, including municipally owned agencies and federal agencies.

i. How much of this \$9 billion you cite was charged by agencies not subject to FERC jurisdiction?

I am informed that the FERC does not directly regulate publicly owned utilities and agencies but may have jurisdiction over some of their activities. In this sense, such agencies have been referred to as "non-jurisdictional." However, on July 25, 2001, the FERC issued an order in which it concluded that its jurisdiction does extend to considering refunds from "non-jurisdictional" sellers for sales made by them into FERC-regulated markets.

Of the roughly \$9 billion in excess charges identified in the Cal-ISO analysis, approximately \$0.8 billion concerned sales from publicly owned utilities and agencies, and another \$2.6 billion in excess charges concerned energy transactions for which the seller was not identified.

ii. Please provide a breakdown of refunds you believe are owed by each such agency, including the Los Angeles Department of Water and Power, the Bonneville Power Administration, and the British Columbia Power Exchange.

I understand that the Cal-ISO has submitted such seller-specific information to the FERC on a confidential basis. I am not aware that this information has been published.

iii. Please describe the actions and the timetable for such actions that the state is taking to pursue refunds from entities not subject to FERC jurisdiction, including municipally-owned agencies and federal agencies.

Pursuant to the July 25 ruling of the FERC, California is asserting claims in proceedings in the relevant FERC dockets with respect to all sellers that sold at unjust and unreasonable prices. Should the FERC eventually prove unable or unwilling to afford a remedy with respect to any sub-category of sellers, the State will then consider alternative venues to seek relief.

c. It has been reported that the Los Angeles Department of Water and Power ("LADWP") has been singled out for seeking high prices during the periods of high demand that helped inflate costs across the entire spot market, where emergency purchases are made. This allegedly was accomplished by offering power at incrementally higher prices that would rise substantially with even modest increases in demand, helping prop up high prices.

- i. Are these allegations true, and if so, when did LADWP's conduct occur?***
- ii. Did LADWP gouge the state of California or manipulate the market to inflate prices?***
- iii. What was LADWP's average hourly bid for electricity, and how does this compare with other sellers?***
- iv. What were the highest bids that LADWP submitted, and when did these bids occur?***

Earlier this year, the above statement may have been an accurate description of the entire market, rather than describing one single provider of electricity. With the deregulation process already in place, California's energy prices on the spot market grew to limitless proportions. Prices spiked dramatically and unpredictably. Reduced supplies and high demand produced conditions that were favorable to those selling energy. Unfortunately, such conditions were costly for the buyer. This was the reason California requested assistance from the Federal Energy Regulatory Commission to set some controls on run-away prices with price caps. Unfortunately, FERC did not respond with such actions until June 2001.

Attached please find two charts. The first will provide you with the average cost per megawatt-hour charged by energy providers, including LADWP. The second shows the highest bids submitted by LADWP, which took place on February 14, 2001.

2. On February 8, you pledged that your Administration would speed up permitting and remove obstacles so that 5,000 megawatts of new electricity supply could be running by July 2001. It is our understanding that there likely will be only about 1,700 megawatts of new supply by July.

a. Is this accurate?

b. If your 5,000-megawatt goal will not be met by July, please explain why the goal will not be met on time and when the goal will be met.

As you may be aware, for the twelve years before I took office, not a single major power plant was built in California. During that time, the economy nearly doubled and the population grew by six million. Beginning in April 1999, my Administration took steps to right the course, moving plants online at a rapid pace. We cut approval times in half and licensed 16 major power plants.

On February 8, 2001, I released a series of executive orders designed to increase generation in the State by 1) increasing output from existing power plants, 2) accelerating construction of power plants already approved, and 3) developing new power plants. In addition, I initiated a comprehensive, aggressive conservation strategy to reduce peak demand. These efforts were designed to bring demand and supply in balance during the summer and consequently to avoid blackouts, price increases and further instability in the electricity system.

Through our combined conservation and generation efforts, the overall objectives for this summer were realized. The combined efforts on the generation side resulted in the addition of 2,231 megawatts of increased generating capacity by the end of July. This number is expected to increase to between 2,700 and 2,900 megawatts by the end of September and well over 3,500 megawatts by the end of December.

Additionally, Californians did a phenomenal job of conserving. Adjusting for weather and economic growth, peak electricity demand in June 2001 declined 5,570 megawatts, or 14.1 percent, compared to June 2000. Without adjusting for the difference in weather and economic growth, there was an actual metered reduction of 3,834 megawatts.

While the state has been successful in streamlining its permitting processes and removing obstacles to allow new generation supplies to be developed, several factors have impacted the total number of plants coming on line this summer.

Many projects approved through the accelerated permitting processes experienced delays in construction due to availability of parts, equipment problems, site control problems, software problems, or mechanical difficulties. Most of these projects will

come on-line shortly. In addition, a few of the qualifying facilities were not able to increase existing generation because they were not able to resolve contract issues with their host utilities in a timely manner.

As you know, the state entered into long-term contracts to stabilize the market and ensure some level of reliability in the future. Most of the projects with such contracts were constructed and brought on-line during the summer. The state did not offer contracts to every project due to excessive prices and concern about purchasing too much long-term power at higher prices. Many of the projects that were not able to obtain long-term contracts withdrew from the permitting process or did not construct approved projects because they feared that the lower electricity prices observed at the end of the summer would not allow them to keep their projects economically viable.

- 3. According to a June 22 Wall Street Journal article, the Cal-ISO estimates that the State conserved 1.7 percent of electricity use in the month of May 2001. You have said that the State saved 11 percent during the same period. Please explain why there is this discrepancy and which figure is accurate.**

Monthly changes in electricity use can be caused by many factors, including weather, economic conditions, and customer conservation. The Cal-ISO was simply reporting the amount of energy used based on actual metered data, and did not account for differences in weather, economic conditions, or customer conservation.

When calculating conservation figures, the California Energy Commission removes the influence of weather and economic conditions to provide an estimate of actual change due to customer conservation. That change in May 2001 was 11 percent.

Such data analysis is critical to understanding the true extent of conservation efforts in the State. Based on data from the National Climatic Data Center, May 2001 was the second hottest year in 107 years in California, while May 2000 was only the 18th hottest. Simply comparing total electricity used during the near-record hot May 2001 to use in a milder May 2000 masks the effect of customer conservation that occurred in that period.

- 4. Concerns have been raised about the secrecy of long-term contracts you entered into earlier this year. According to some reports, the State agreed to pay much higher prices than it should have for this power.**
- a. Please indicate the price terms of each of these contracts on a dollar per megawatt-hour basis, and the length of each contract.**
 - b. Please compare these prices to current market prices.**

These documents have been available to the public since June 15, 2001. Comparisons of prices often do not take into account the conditions at the actual time of negotiations, which included runaway prices on the spot market and the State's considerable

exposure to the spot market. Faced with these obstacles, the Department of Water Resources negotiated contracts at the best possible price at the time of the transactions. The goals of the long-term contracts were to:

- 1) lessen the State's exposure to runaway, unpredictable power costs on the spot market;
- 2) increase the amount of megawatts being made available to the market at a time when power was unusually scarce; and
- 3) secure enough power to keep the lights on in California while providing a market shift in favor of the buyer.

These goals have been accomplished.

Prices for each specific contract are not available at this time, for two primary reasons:

- 1) Roughly half of the long-term contracts have a natural gas component which allows the overall price to shift in accordance with current market prices for natural gas; and
- 2) Contracts with "dispatchable" power must make assumptions as to the amount of hours used to determine its overall price. With these factors, considerable mathematical models using these key assumptions on current and future gas prices as well as expected hours or usage must be projected to ascertain specific contract prices.

Although individual contract numbers are not available, the State has provided projections of these contracts on an aggregate basis. These projections, which are currently being updated, show an average price of \$70 per megawatt hour over the next 10 years. That number includes an average price of \$138 per megawatt hour from May 2001 to December 2001 and an average price of \$59 per megawatt hour in 2010.

Current spot market prices range anywhere from \$20 to \$60 per megawatt hour, depending on the product (peak or base). However, spot market prices the first two months of this year averaged nearly \$320 per megawatt hour. In essence, the infusion of power into the market created an increase in supply while simultaneously lowering overall demand. The market responded by offering more favorable prices to the buyer. The market turned from a sellers' market to a buyers' market.

5. It is our understanding that the State of California has spent billions of dollars buying power this year.

a. How much money has the State spent on power purchases so far this year?

From January 17, 2001 through August 31, 2001, the California Department of Water Resources has spent \$10.4 billion. However, dollars spent per month have declined dramatically. The chart below illustrates total cost for all power purchases:

	Avg. Daily Cost	Total Avg. Cost Per MWh	Spot Market Avg. Cost Per MWh
January 17-31	\$39 million	\$332	\$321
February	\$51 million	\$304	\$308
March	\$58 million	\$261	\$271
April	\$62 million	\$269	\$331
May	\$65 million	\$243	\$271
June	\$35 million	\$168	\$113
July	\$30 million	\$146	\$78
August	\$26 million	\$131	\$53

b. How much do you expect to spend through the end of the year?

The Department of Water Resources anticipates that it will have spent approximately \$14 billion from January 17, 2001 through December 31, 2001.

6. You have described the 1996 California deregulation law as a failure.

a. As Lieutenant Governor, did you oppose Proposition 9, which would have repealed the 1996 deregulation law?

b. As Governor, have you proposed amendments to the 1996 deregulation law?

Both my Republican opponent and I opposed Proposition 9.

7. In your testimony, you mention a recent agreement that may result in the restart of idle qualifying facility generation. It is our understanding that this generation was idle because the State set rates below cost, and the owners of these facilities shut them down rather than operate at a loss.

During the winter/early spring, PG&E and Edison both stopped making payments to Qualifying Facilities (QFs) for several months. Furthermore, in a period of rapidly escalating gas prices, gas-fired QFs asserted that the formula for computation of short-run avoided cost did not yield prices adequate to compensate them for their actual operating costs. In response to these factors some QFs did shut down for a time. Subsequent California Public Utilities Commission actions ordered the resumption of QF payments, and there was also considerable wrangling about modifying the payment formula so that it would result in prices adequate to cover QF fuel costs. The upshot of these actions was that most QFs did come back on line.

a. Did the shutdown of these facilities contribute to the blackouts that occurred in California in March and April?

Yes.

b. Why did it take three months before this problem was resolved?

As mentioned above, the Qualifying Facilities (QFs) were owed approximately \$1.3 billion for the three months they were offline. During that period, some QFs were operating but selling power on the spot market at spot market prices, while others had shut down. Significant volumes of litigation ensued.

The goals of the negotiations that ensued – as reflected in the final agreement – were to bring megawatts back online; take QFs off the spot market and have them return to selling energy at a negotiated price; and to end the protracted litigation.

These matters were successfully negotiated under very difficult circumstances during this three-month period.

8. You have indicated that the approximately \$9 billion in alleged overcharges will go to consumers. Our understanding is that any refunds would actually go to California utilities with large unrecovered wholesale power costs.

- a. **Please explain how the refunds will go to the ratepayers when these refunds represent wholesale costs and retail rates to ratepayers that were not included in retail rates.**
- b. **If refunds are ordered, who will get them – consumers or California utilities -- what percentage would go to each group?**

Some of the excess wholesale costs have been billed to retail ratepayers. Other excess charges have not yet flowed to retail consumers but have been booked for future billing in retail rates. Finally, some of the excess charges to load serving utilities are subject to continuing dispute as to whether and to what extent these charges can be passed to consumers. While the State has taken the position that many of these excessive charges should not be passed through to consumers, it is clearly in the interest of consumers to have all of the charges adjusted to reflect reasonable rates.

Because there are still many disputes and contingencies concerning the allocation of some of these charges, it is not possible to state percentages. As a general principle, refunds would credit to the benefit of whoever had been ultimately burdened with payment responsibility for the excessive charges.

9. Recently by executive order, you lifted State pollution control standards for power plants.

- a. **How much additional pollution will be released in California due to the lifting of the pollution control standards?**

Emissions from power plants in California have decreased this summer. Therefore, there have not been net increases in emissions resulting from the executive orders that enabled greater power plant operation. Estimates by the California Air Resources Board indicate that Statewide emissions from power plants for Summer 2001 are as much as 30 percent less than for Summer 2000. There are several reasons for the

decrease. First, since Summer 2000, nearly 5000 megawatts of existing generation facilities have been retrofitted with pollution controls. Second, energy conservation efforts have made significant gains on reducing overall and peak demand from last year. And last, over 1500 megawatts of new clean generation capacity have come online.

Two of the primary goals of the executive orders were to expedite the siting of new power generation facilities and to ensure that existing generation facilities remain online. Many of the existing peaking generation facilities in the State are limited in the number of hours they can be operated. Where peaking facilities bump up against their annual limits, the executive orders grant districts the authority to temporarily lift the hourly limits, provided the units are run only when called upon by the State and a mitigation fee is paid to the district.

Early predictions for Summer 2001 indicated that existing peaking facilities would need to run considerable hours to avoid blackouts throughout the State. However, the need to run these units did not materialize as expected.

b. Will the State estimate the change in emissions due to the lifting of pollution control standards?

As stated above, there were no net increases in emissions over this year's peak electrical demand period. Air Resources Board staff is collecting data from local districts, power plant operators, the California Independent System Operator, and the California Energy Commission to more precisely determine emissions from power generation in the State. As information is compiled, the Air Resources Board will develop more detailed emissions estimates.

In your second letter, you asked several additional questions regarding the Los Angeles Department of Water and power, including:

1a. What prices did the LADWP charge between May 1, 2000 and May 31, 2001, and did those charges exceed cost plus 15% for electricity at any time from May 1, 2000 to May 31, 2001?

1b. If so, how much over cost plus 15% did the LADWP charge and when did these charges occur?

2a. From May 1, 2000 through May 31, 2001, did the LADWP include in its calculation of costs \$34 million for the City of Los Angeles' general fund and an additional \$42 million in overhead for such things as debt payment and return on the agency's capital investments as alleged in the article?

2b. If so, do you believe these charges to be just and reasonable?

The State did not begin buying power until January 17, 2001. I have attached for your review a chart of electricity purchases the State made, including the number of

megawatts provided, the total charge, and the average cost for each month from January 2001 through August 2001 from specific entities including LADWP.

LADWP is an independent entity, and I would therefore refer you to the Los Angeles City Council or the Mayor of Los Angeles for a detailed explanation and analysis of its transactions.

**Highest Purchase Prices From
Los Angeles Department of Water and Power
February 14, 2001**

Hour Ending at:	Volume in MW	Price/MW	Total
8:00	200	\$758.00	\$151,600
9:00	200	\$1294.00	\$258,800
10:00	200	\$1294.00	\$258,800
11:00	300	\$1294.00	\$388,200
12:00	300	\$1294.00	\$388,200
20:00	300	\$1294.00	\$388,200
21:00	200	\$1294.00	\$258,800

**RESPONSE TO
QUESTIONS FOR THE RECORD FOR S. DAVID FREEMAN
FROM SENATOR FRED THOMPSON**

1. As you know, a number of concerns have been raised about the conduct and pricing practices of the Los Angeles Department of Water and Power ("LADWP").

a. Were you the general manager of the Los Angeles Department of Water and Power from May 2000 to April 17, 2001?

Yes, except that I was on lease to assist the State of California in negotiating long term contracts from January 26, 2001 to March 12, 2001.

b. As general manager, were you ultimately responsible for sales of electricity by the LADWP?

No. The responsibility is vested in a 5 person Board of Commissioners and the Los Angeles City Council and Mayor.

c. Is any of the information or quotes in the April 11, 2001 Los Angeles Times article (attached) inaccurate? If so, please explain.

The information and conclusions in the ISO report, to which the article refers, do not accurately report LADWP's pricing policy.

First, it fails to reflect the fact that I personally lead the effort by municipal utilities to lower the cap on prices the ISO paid. I advocated lower, not higher, prices.

Second, it is not based on LADWP's costs and thus fails to reveal that LADWP's prices reflected costs from old, inefficient plants or pumped storage plants which require fuel for water pumping in addition to the fuel for generation. Thus our costs - with high natural gas costs - were quite high. We added 15% to our costs as our cost base rate. This was power made available on request at the last minute.

Third, we did accept prices at the ISO capped price during the time that their practice was to pay everyone the market-clearing price. This was not gouging - it was merely accepting the price the ISO paid.

**RESPONSE TO
QUESTIONS FOR THE RECORD FOR S. DAVID FREEMAN
FROM SENATOR FRED THOMPSON (cont'd)**

- d. Do you believe that the LADWP gouged the state of California or manipulated markets at any time during the period from May 2000 to April 17, 2001? Please explain.

No.

2. Did you serve as an unpaid adviser to Governor Davis at any time prior to April 17, 2001?

Yes.

- a. If so, during any time that you served as an unpaid adviser to Governor Davis prior to April 17, 2001, did you oversee the purchase of electricity on behalf of the State?

I did not "oversee the purchase of electricity" by the state. My job was confined to negotiating long term contracts with specific companies and I was very careful to have absolutely no discussions or any kind of involvement with LADWP.

- b. During any time that you served as an adviser to Governor Davis prior to April 17, 2001, were you still employed by the LADWP?

Yes, I was an employee of DWP on lease negotiating long-term power contracts (not with LADWP) from January 26 until March 12, 2001.

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426

OFFICE OF THE CHAIRMAN

July 13, 2001

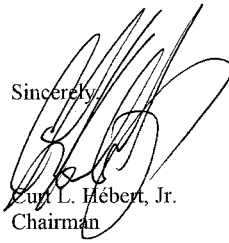
The Honorable Joseph I. Lieberman
Chairman
Committee on Governmental Affairs
United States Senate
Washington, DC 20510-6150

Dear Senator Lieberman:

Thank you again for giving me the opportunity to testify at the Committee's June 20, 2001 oversight hearing reviewing the role of the Federal Energy Regulatory Commission in the restructuring of U.S. energy industries, particularly with respect to the cost and supply of electricity in California and the Western United States.

As you know, the Commission has taken and continues to take a number of actions to address the energy market situation, and to lower energy prices, in California and throughout the West. These steps are detailed in the enclosed responses. Attached you will find my answers to the additional questions from Senator Thompson, to be included in the hearing record.

Sincerely,



Earl L. Hébert, Jr.
Chairman

Enclosures

cc: The Honorable Fred Thompson

Responses to Questions from Senator Thompson

1. **Governor Davis's testimony implies that FERC has taken virtually no action with respect to the California electricity crisis. In his testimony, the Governor states "at every point where the Federal Energy Regulatory Commission could have restored some sanity to wholesale prices, it failed to do so." In his oral testimony, the Governor also stated that "It is unconscionable that the [Federal Energy Regulatory] Commission look the other way while energy companies bilk Californians out of \$9 billion."**
 - a. **Are these statements accurate?**
 - b. **If not, please explain and detail the actions that FERC has taken.**

These statements are inaccurate. Contrary to the Governor's testimony, the Commission has taken many decisive actions to deal with the problems of California and the West. I attached to my written testimony to the Committee, presented on June 20, 2001, a 16-page summary of recent Commission actions on California and Western electricity markets.

In particular, the Commission has issued dozens of orders to address the California and Western wholesale electricity markets. In addition to our orders on the numerous supplemental filings by the California Independent System Operator Corporation (CA ISO), as well as complaints by other parties, to implement various changes to protocols and other procedures to correct perceived defects in the market design, the Commission has taken careful, reasoned steps to address the California wholesale electricity market. Among the more significant of these actions are:

- * The issuance of an August 23, 2000 order instituting formal hearing proceedings to investigate the justness and reasonableness of the rates for energy and ancillary services of public utility sellers into the California ISO and Power Exchange (PX) spot markets, with the establishment of an October 2, 2000 refund effective date for those proceedings
- * The issuance of a November 1, 2000 staff investigation report on Western markets and the causes of the Summer 2000 price increases, in response to a Commission order issued July 26, 2000
- * The issuance of a December 15, 2000 order directing certain prospective remedies for wholesale electricity markets in California, establishing price mitigation and imposing increased reporting requirements

- * The issuance of an order on March 9, 2001, followed by periodic notices, requiring sellers to identified transactions to either refund (or offset) certain amounts or provide additional information justifying their prices
- * The issuance of March 14, 2001 and May 16, 2001 orders removing obstacles and providing incentives to increased energy supply and reduced demand in California and the rest of the West
- * The issuance of a March 14, 2001 show cause order, and subsequent April 30, 2001 approval of a settlement, directing refunds for coordinated conduct by Williams Energy Marketing & Trading Company and AES Southland, Inc. to extend outages at certain generating facilities
- * The institution of an evidentiary hearing, in orders issued on March 28 and June 11, 2001, as to whether El Paso Natural Gas Company and its marketing affiliate exercised market power or engaged in affiliate abuse to drive up natural gas prices at the California border
- * The issuance of an April 26, 2001 order establishing a new mitigation and monitoring plan for wholesale electricity markets in California, and establishing an investigation of wholesale electricity prices throughout the West
- * The issuance, on May 18 and 22, 2001, of proposed new reporting requirements for natural gas prices and a notice seeking comment on whether to re-impose ceiling prices for capacity release transactions on pipelines serving California
- * The issuance of a June 19, 2001 order, on rehearing of the Commission's April 26 order noted above, that established West-wide mitigation and established a settlement conference to complete the task of settling past accounts and structuring new market arrangements, including refund (offset) issues and creditworthiness matters
- * The expedited issuance of various orders in recent months approving additional amounts of natural gas pipeline capacity to California and additional generation at Western hydroelectric facilities

As to the accuracy of Governor Davis's figures concerning potential overcharges, I address this matter later in response to question 4.

2. **Governor Davis's testimony states that "FERC's first attempt to address the collapse of our electricity market came on December 15, 2000." Is that an accurate statement? Please explain.**

The statement is inaccurate. The Commission, of course, has been addressing the design and operation of restructured California electricity markets since 1996, in response to filings submitted by market participants and institutions to implement the California ISO and PX. Last year, the Commission initiated its staff investigation of the Western market on July 26, 2000, and began a formal 206 investigation on August 23, 2000. As noted in my response to question 1, the Commission has taken actions to respond to numerous requests to change market rules and the market design of the California wholesale electricity market prior to December 15, 2000.

While the December 15 order reflects the Commission's comprehensive attempt to address the dysfunctions in California wholesale electricity markets, that order identified a number of necessary measures which are not within the jurisdiction of the Commission to implement, but rather within the domain of the State of California and its Public Utilities Commission and Energy Commission. Significant among the actions within the control of California are the siting of new electric generating and transmission facilities, the ability of California utilities to develop a diversified portfolio of energy products and hedging instruments, and the establishment of demand side response signals from retail customers to changes in wholesale electricity prices, all of which contributed to the "collapse of the [California] electricity market" and are critical to resolving California's energy problems.

3. **Governor Davis's testimony states that FERC set a soft cap for wholesale electricity prices. Why did FERC raise the hard cap and set a soft cap?**

The price mitigation adopted by the Commission in its April 26 order, and later revised and expanded in its June 19 order, relies on market solutions and mechanisms to the maximum extent possible. In those orders, the Commission replaced the modified single clearing price auction mechanism that was instituted by our December 15 order. Under the December 15 order, sellers bidding above \$150/MWh would be paid their actual bids subject to cost justification of such bid. Under the April 26 and June 19 orders, in place of the \$150 "breakpoint" method, the Commission imposed a single clearing price auction method derived from must offer and marginal cost bidding where seller bids (prices) are mitigated during times when supply is scarce relative to demand (*i.e.*, when the reserve margin falls below 7 percent). The mitigated price is set by the California ISO based on the marginal cost data of generators supplying energy during the capacity shortage period. Seller bid prices during other hours (*i.e.*, non-reserve

deficiency periods) are limited to 85 percent of the mitigated price established by the California ISO during the previously declared capacity shortage unless the seller provides information to support its higher cost.

The current procedure is intended to reflect expected prices that would occur under competitive conditions. This approach is not a cap on wholesale electricity prices because generators may justify a higher price if they can document higher costs.

In contrast, hard buyer caps were in place last year when prices in California electricity markets first shot higher. Specifically, last summer, the ISO reduced the purchase price cap in energy and ancillary service markets from \$750 to \$500 and then to \$250, only to find that average prices continued to rise. The Commission removed the hard purchase price cap on December 8, 2000, at the urging of the ISO, which explained that the cap was hindering its ability to procure emergency supplies and thus keep the lights on.

4. **Governor Davis's testimony demands that FERC approve refunds of \$8.9 billion. It is our understanding that in April, the California ISO testified that an earlier \$6.2 billion figure was inflated, since it included alleged overcharges that FERC has no legal authority to remedy, including charges by nonjurisdictional entities such as California municipal utilities, and alleged overcharges that preceded October 2, 2000.**

- a. **Is that understanding correct?**

The Commission discussed the \$6.2 billion figure (which the ISO revised upward to \$6.7 billion) in its price mitigation and market monitoring order issued on April 26, 2001. See 95 FERC ¶ 61,115 (2001). There, the Commission summarized the circumstances as follows:

The ISO now contends that costs in excess of competitive levels now exceed \$6.7 billion due to an additional \$430 million not included in the earlier analysis. However, . . . the ISO notes that approximately \$2.7 billion represents bilateral and self-supply energy scheduled outside of the PX and ISO markets. Of the remaining \$4 billion, approximately \$3.1 billion is subject to FERC jurisdiction. However, \$1.8 billion occurred prior to October 2000. What remains in dispute is \$1.3 billion for the period October 2000 through February 2001.

95 FERC at 61,353 n.7.

b. Does FERC have legal authority to order nonjurisdictional entities like California municipal utilities to refund unjust and unreasonable charges?

In the April 26 Order, the Commission extended its price mitigation to non-public utilities, whose power sales are otherwise outside the Commission's rate jurisdiction under FPA sections 205 and 206, by imposing such mitigation as a condition of the non-public utilities being able to sell into the ISO's markets regulated by the Commission or use the ISO's transmission facilities regulated by the Commission. In its Order issued June 19, 2001, the Commission extended its price mitigation to non-public utilities throughout the Western Systems Coordinating Council by imposing the same condition on them if they sell into Commission-regulated markets or use Commission-regulated transmission facilities. See 95 FERC ¶ 61,418 (2001). In both Orders, the Commission stated that, absent the extension of its price mitigation, the Commission could not ensure just and reasonable rates, terms and conditions for jurisdictional services. Under the Commission's price mitigation approach, spot market sales by generators above the mitigated prices are subject to justification and refund. To this extent, the Commission has asserted authority to require refunds of prospective sales by non-public utilities. The issue of the Commission's authority to impose this mitigation condition on non-public utilities has been appealed to the D.C. Circuit. See Imperial Irrigation District, et al. v. FERC, No. 01-1288, et al. (D.C. Cir. June 27, 2001).

c. Does FERC have legal authority to order public utilities to refund unjust and unreasonable charges that predate October 2, 2000.

In an Order issued November 1, 2000, the Commission included a lengthy Appendix addressing this issue. Appendix E, 93 FERC ¶ 61,121 at 61,376-82 (2000). The Commission summarized the conclusion of the Appendix as follows: "The FPA and the weight of court precedent strongly suggest that retroactive refunds are impermissible in these circumstances." 93 FERC at 61,371. This issue, however, is still pending before the Commission and, thus, I cannot comment further at this time.

d. How much of the \$8.9 billion estimates represent overcharges that FERC has legal authority to remedy?

I do not have information explaining how this amount was derived. However, the components of the earlier estimate of \$6.2 billion are identified above, in response to Question 4(a).

5. **It is our understanding that the December 15, 2000 FERC order laid out a number of steps the State of California could take to address its electricity crisis. For example, the order eliminated the requirement that State-regulated electric utilities sell all their generation into, and buy all of their generation from, spot markets. Did California take advantage of this aspect of the order in a timely manner to shift power purchases from the spot market to longer term contracts?**

One of the fundamental goals of the Commission's December 15, 2000 order and later orders was to move California utilities away from undue reliance on volatile, high-priced spot markets and to promote the stability of long-term, forward contracting. The Commission concluded that the utilities should rely on spot markets for no more than 5 percent of their needs. In response, the California investor-owned utilities have shifted many of their power purchases from the spot market to longer-term contracts. However, the ability to contract in forward markets has been complicated by financial considerations involving California utilities and the California Department of Water Resources, which has been designated as the creditworthy purchaser on behalf of those utilities. While significant progress has been made, at the time of our June 19 order approximately 20 percent of California's load remains in the California ISO's spot markets at peak periods, with higher percentages in spot markets during off-peak periods.

I am hopeful that the Commission's recent efforts to reform markets, to lower prices and to stimulate infrastructure development and demand reduction, through a series of market-oriented initiatives, will motivate California utilities to rely even less on spot purchases and to develop a balanced portfolio of risk-reducing contracts and financial instruments.

6. **The December 15, 2000 FERC order provided that the California ISO stakeholder board be replaced with an independent board. It is our understanding that the State dismissed the stakeholder board, but installed a board composed entirely of appointees of Governor Davis.**
- a. **Does the current composition of the California ISO meet the independent criterion in FERC's order?**

Parties have argued in pleadings pending before the Commission that the current composition of the ISO's board does not meet the Commission's requirements. See Docket Nos. EL00-95-005, EL01-35-000, EL00-95-012, EL00-95-030, EL00-98-029, and Docket Nos. RT01-85-001, RT01-83-000, RT01-82-000, RT01-92-000. Thus, I cannot comment on the merits of this issue. However, independence from market

participants is a critical criterion for both ISOs and Regional Transmission Organizations. If the Commission concludes that the ISO's independence has been compromised, I believe the Commission should take aggressive action to restore the ISO's independence.

b. Does FERC believe that the State, which is the biggest electricity purchaser in California, should control the ISO?

Please refer to the preceding answer.

7. FERC's press release on Jun 18, 2001 announcing the new mitigation order stated: "The Commission must balance two statutory goals: protecting customers against unreasonable rates and encouraging adequate supplies to meet those customers' power supply needs."

a. Is that an accurate statement of FERC's statutory goals?

To be precise, FERC's statutory goal is to ensure that the rates, terms and conditions of jurisdictional services are just and reasonable. The courts have said that the Federal Power Act does not require the use of any particular ratemaking method, so long as the end result of any ratemaking order is within a zone of reasonableness, "tak[ing] fully into account the probable consequences of a given price level for future programs of exploration and development." Permian Basin Area Rate Cases, 390 U.S. 747, 797 (1968); see Atlantic Refining Co. v. Pub. Service Comm., 360 U.S. 378, 388 (1959) (same).

b. Is FERC's statutory goal to ensure adequate supplies of electricity as important, less important, or more important than its statutory goal to protect customers against unreasonable rates?

In setting rates, the Commission seeks an appropriate balancing of these goals and other relevant considerations. The Commission also must weigh the short-term benefit for consumers from artificially low rates against the shortages that such rates will likely cause in the future. I am convinced that the only effective way to lower rates and keep them low in the future, and to provide for a truly competitive market that will afford real choice and thus benefit all consumers, is to act affirmatively to promote and assure supply and delivery capability.

c. How will you determine whether FERC's mitigation order is encouraging adequate supplies of electricity?

The Commission receives and evaluates information on such issues through a range of sources, including pleadings filed by parties in formal proceedings, review of industry-compiled data (such as NERC reports on generation reserves), ongoing monitoring of market conditions, cooperation with market participants and governmental institutions, and frequent meetings with industry representatives.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF THE COMMISSIONER

July 17, 2001

The Honorable Joseph I. Lieberman
Chairman
Committee on Governmental Affairs
United States Senate
Washington, DC 20510-6150

Dear Senator Lieberman:

Thank you for your June 28, 2001, letter requesting additional information related to the Committee's June 20, 2001 oversight hearing reviewing the role of the Federal Energy Regulatory Commission in the restructuring of energy industries. I appreciate the Committee's interest in these important and challenging issues confronting energy consumers and suppliers. I look forward to working with the Committee in our continuing effort to effectively resolve these issues.

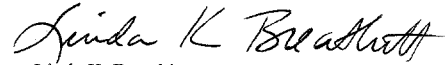
As I testified before the Committee on June 20, the Commission has been actively involved over the past year in defining and understanding the causes of the market disruptions and high electricity prices in California and throughout the West and implementing appropriate remedies, which are beginning to work. Among the most important actions taken by the Commission in this regard has been the elimination of the mandatory buy-sell requirement and the elimination of the California Power Exchange's rate schedule in our order issued on December 15, 2000. These actions have had the intended result of reducing the California investor-owned utilities' over-reliance on volatile spot markets and spurring an increase in longer-term contracts. In addition, I believe our market monitoring and price mitigation orders issued on April 26, 2001 and June 19, 2001 are beginning to have a dampening effect on electricity prices in California.

The questions now posed by Senator Thompson address issues related to these orders and other actions taken by the Commission. I have reviewed the responses

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submitted by Chairman Hébert to Senator Thompson's questions, to be included in the hearing record. I concur with and adopt Chairman Hébert's responses. I hope this additional information assists the Committee in its consideration of these matters.

Sincerely,

A handwritten signature in cursive script that reads "Linda K. Breathitt".

Linda K. Breathitt
Commissioner

cc: The Honorable Fred Thompson

**WILLIAM L. MASSEY, COMMISSIONER
FEDERAL ENERGY REGULATORY COMMISSION
RESPONSES TO QUESTIONS FOR THE RECORD
FOR MEMBERS OF THE FEDERAL ENERGY REGULATORY COMMISSION
FROM SENATOR FRED THOMPSON
JULY 13, 2001**

- 1. Governor Davis's testimony implies that FERC has taken virtually no action with respect to the California electricity crisis. In his testimony, the Governor states "at every point where the Federal Energy Regulatory Commission could have restored some sanity to wholesale prices, it failed to do so." In his oral testimony, the Governor also stated that "It is unconscionable that the [Federal Energy Regulatory] Commission look the other way while energy companies bilk Californians out of \$9 billion."**
 - a. Are these statements accurate?**
 - b. If not, please explain and please detail the actions that FERC has taken.**

In his response to this question, Chairman Hebert accurately lists actions that the Commission has taken in response to the California crisis. I agree with Governor Davis that the Commission could have restored sanity to wholesale prices much sooner. For example, I dissented from the Commission's August 23, 2000 order responding to the San Diego Gas and Electric Company complaint because it did not impose a price cap at that time. I believe the evidence at the time indicated a dysfunctional wholesale market. Effective price controls imposed last August would have prevented the economic carnage that spread throughout the western interconnection over the past year.

- 2. Governor Davis's testimony states that "FERC's first attempt to address the collapse of our electricity market came on December 15, 2000." Is that an accurate statement? Please explain.**

The statement is accurate, but the Commission's December 15, 2000 attempt almost immediately proved to be ineffectual in controlling runaway prices.

- 3. Governor Davis's testimony states that FERC set a soft cap for wholesale electricity prices. Why did FERC raise the hard cap and set a soft cap?**

I now believe it was a mistake to eliminate the hard cap on December 8, 2000 and set a soft cap on December 15, 2000. The Commission should have understood that, to be effective, any cap must be applied to the entire western interconnection.

4. **Governor Davis's testimony demands that FERC approve refunds of \$8.9 billion. It is our understanding that in April, the California ISO testified that an earlier \$6.2 billion figure was inflated, since it included alleged overcharges that FERC has no legal authority to remedy, including charges by nonjurisdictional entities such as California municipal utilities, and alleged overcharges that preceded October 2, 2000.**
- a. **Is that understanding correct?**
 - b. **Does FERC have legal authority to order nonjurisdictional entities like California municipal utilities to refund unjust and unreasonable charges?**
 - c. **Does FERC have legal authority to order public utilities to refund unjust and unreasonable charges that predate October 2, 2000?**
 - d. **How much of the \$8.9 billion estimates represent overcharges that FERC has legal authority to remedy?**

I agree with Chairman Hebert's responses to these questions.

5. **It is our understanding that the December 15, 2000 FERC order laid out a number of steps the State of California could take to address its electricity crisis. For example, the order eliminated the requirement that State-regulated electric utilities sell all their generation into, and buy all their generation from, spot markets. Did California take advantage of this aspect of the order in a timely manner to shift power purchases from the spot market to longer term contracts?**

I agree with Chairman Hebert's response to this question.

6. **The December 15, 2000 FERC order provided that the California ISO stakeholder board be replaced with an independent board. It is our understanding that the State dismissed the stakeholder board, but installed a board composed entirely of appointees of Governor Davis.**
- a. **Does the current composition of the California ISO meet the independent criterion in FERC's order?**
 - b. **Does FERC believe that the State, which is the biggest electricity purchaser in California, should control the ISO?**

I agree with Chairman Hebert's responses to these questions.

7. **FERC's press release on June 18, 2001 announcing the new mitigation order stated:**
"The Commission must balance two statutory goals: protecting customers against unreasonable rates and encouraging adequate supplies to meet those customers' power supply needs."

- a. **Is that an accurate statement of FERC's statutory goals?**

I agree with Chairman Hebert's response to this question.

- b. **Is FERC's statutory goal to ensure adequate supplies of electricity as important, less important, or more important than its statutory goal to protect customers against unreasonable rates?**

Please see Chairman Hebert's response to this question. I would add that I interpret the Federal Power Act's just and reasonable standard as incorporating the balancing of supply and consumer prices. The price signal that arises from a well functioning market will induce sufficient supply. I am convinced that the Commission must aggressively intervene to protect consumers when markets are dysfunctional.

- c. **How will you determine whether FERC's mitigation order is encouraging adequate supplies of electricity?**

I agree with Chairman Hebert's response to this question.

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D. C. 20426

JUL 13 2001

OFFICE OF THE COMMISSIONER

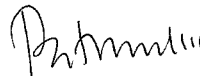
The Honorable Joseph I. Lieberman
Chairman
Committee on Governmental Affairs
United States Senate
Washington, D.C. 20510

Dear Chairman Lieberman:

Thank you for your letter dated June 28, 2001, requesting that I provide responses to questions from Senator Thompson that arose following my testimony before your Committee on June 20, 2001. My responses to these questions are enclosed.

If I can be of further assistance, please let me know.

Sincerely,



Pat Wood, III
Commissioner

Enclosure

Responses to Questions from Senator Thompson

1. **Governor Davis's testimony implies that FERC has taken virtually no action with respect to the California electricity crisis. In his testimony, the Governor states "at every point where the Federal Energy Regulatory Commission could have restored some sanity to wholesale prices, it failed to do so." In his oral testimony, the Governor also stated that "It is unconscionable that the [Federal Energy Regulatory] Commission look the other way while energy companies bilk Californians out of \$9 billion."**
 - a. **Are these statements accurate?**
 - b. **If not, please explain and please detail the actions that FERC has taken.**
 - 1a. I do not believe the statements are wholly accurate.
 - 1b. Since my arrival at the agency, the FERC has taken decisive measures to address market discipline in the broader Western electric market in orders issued on June 19, 2001. For detailed actions the FERC has taken prior to that time, I would adopt Chairman Hébert's response to this question.
2. **Governor Davis's testimony states that "FERC's first attempt to address the collapse of our electricity market came on December 15, 2000." Is that an accurate statement? Please explain.**

Since these issues predated my arrival at the agency, I would adopt Chairman Hébert's response to this question.
3. **Governor Davis's testimony states that FERC set a soft cap for wholesale electricity prices. Why did FERC raise the hard cap and set a soft cap?**

On December 8, 2000, the FERC eliminated the hard \$250 cap and replaced it with a soft cap at the request of the California Independent System Operator.
4. **Governor Davis's testimony demands that FERC approve refunds of \$8.9 billion. It is our understanding that in April, the California ISO testified that an earlier \$6.2 billion figure was inflated, since it included alleged overcharges that FERC has no legal authority to remedy, including charges by nonjurisdictional entities such as California municipal utilities, and alleged overcharges that preceded October 2, 2000.**
 - a. **Is that understanding correct?**

- b. **Does FERC have legal authority to order nonjurisdictional entities like California municipal utilities to refund unjust and unreasonable charges?**
- c. **Does FERC have legal authority to order public utilities to refund unjust and unreasonable charges that predate October 2, 2000?**
- d. **How much of the \$8.9 billion estimates represent overcharges that FERC has legal authority to remedy?**
 - 4a. Your understanding correct.
 - 4b. The matter of the FERC's legal authority to order refunds by nonjurisdictional entities is something the FERC will be addressing in the refund proceeding, which could be as soon as July 25th.
 - 4c. The issue of FERC's legal authority to address possible refunds earlier than the 60th day following a Section 206 complaint is something the FERC will be addressing in the refund proceeding, which could be as soon as July 25th.
 - 4d. I do not have information that would allow me to answer this question, even with a ballpark estimate. The determination of the appropriate refund amounts will need to be done by a trier of fact with appropriate cross-examination and testing of qualified witnesses. It is my expectation this will be done swiftly and fairly, so this issue can be resolved and parties can move forward in a more constructive manner.
- 5. **It is our understanding that the December 15, 2000 FERC order laid out a number of steps the State of California could take to address its electricity crisis. For example, the order eliminated the requirement that State-regulated electric utilities sell all their generation into, and buy all their generation from, spot markets. Did California take advantage of this aspect of the order in a timely manner to shift power purchases from the spot market to longer term contracts?**

To its credit, the California purchasers of electricity have substantially moved their power purchases out of the spot market into longer-term contractual arrangements. While there is still, perhaps, more reliance on the spot market than may be prudent, the situation is far different from what it was in late 2000. California has also begun other remedies, including widespread energy conservation and retail price increases, that are helping to moderate the situation.
- 6. **The December 15, 2000 FERC order provided that the California ISO stakeholder board be replaced with an independent board. It is our understanding that the**

State dismissed the stakeholder board, but installed a board composed entirely of appointees of Governor Davis.

- a. Does the current composition of the California ISO meet the independent criterion in FERC's order?
- b. Does FERC believe that the State, which is the biggest electricity purchaser in California, should control the ISO?

6a./6b. The current composition of the California ISO Board is the subject of a pending filing made by the California ISO in response to the FERC's April 26, 2001 order. I expect the FERC will speak to this precise issue in the near future.

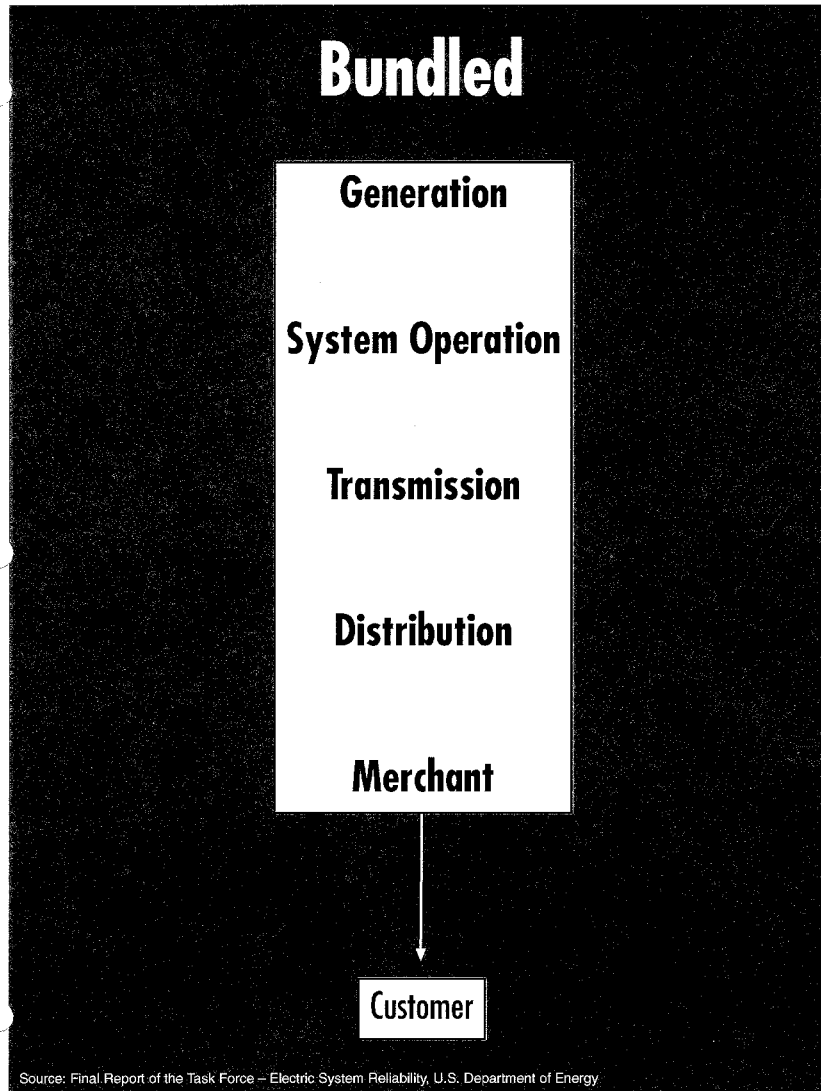
7. **FERC's press release on June 18, 2001 announcing the new mitigation order stated: "The Commission must balance two statutory goals: protecting customers against unreasonable rates and encouraging adequate supplies to meet those customers' power supply needs."**

- a. **Is that an accurate statement of FERC's statutory goals?**
- b. **Is FERC's statutory goal to ensure adequate supplies of electricity as important, less important, or more important than its statutory goal to protect customers against unreasonable rates?**
- c. **How will you determine whether FERC's mitigation order is encouraging adequate supplies of electricity?**

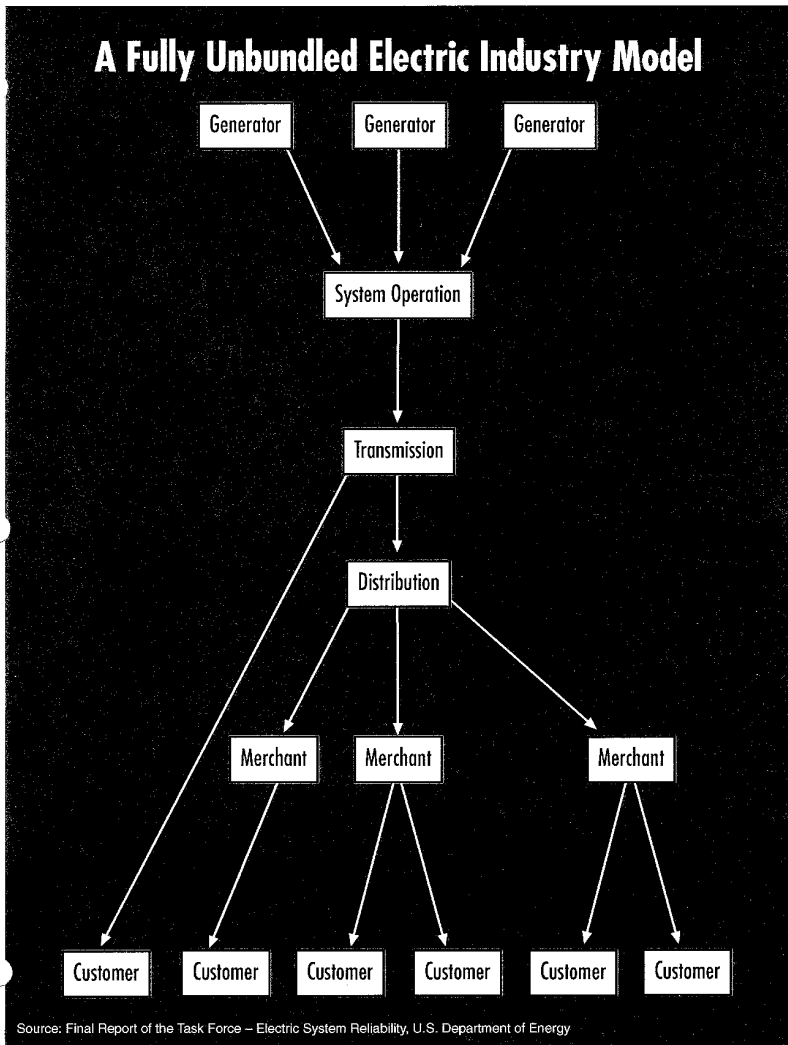
7a. The statement is not taken from the statute directly.

7b. Both goals are of equal importance.

7c. It is difficult to isolate the impacts of one event, such as our June 19th order, but the FERC continues to track the progress of parties in making needed investment in electricity and natural gas infrastructure. The FERC will continue to urge such investment to continue at the pace promised by California officials, and I remain open to making appropriate changes to the FERC's approach, using the measures available to us, to provide greater investment certainty for the California market.



A Fully Unbundled Electric Industry Model



Source: Final Report of the Task Force – Electric System Reliability, U.S. Department of Energy

**TESTIMONY OF
THE HONORABLE JUDY MARTZ
GOVERNOR OF MONTANA
BEFORE THE
COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE**

June 20, 2001

Mr. Chairman and members of the Committee, my name is Judy Martz and I am Governor of the Big Sky State of Montana. I appreciate the interest this Committee has shown in the struggles of Western states to deal with an electricity crisis.

We are here to discuss "The Role of the Federal Energy Regulatory Commission Associated with the Restructuring of Energy Industries." However, the real issue seems to be: "What went wrong in California and could it happen anywhere else?"

Let me try to answer this question. The facts show that the primary responsibility for the electricity crisis in the West lies with the State of California. A series of mistakes made by the State, and a failure by the State to take corrective action once problems first arose more than a year ago, led directly to this crisis.

This crisis could have been avoided if California had taken timely action. Instead of acting, the State has unfortunately engaged in a prolonged exercise of blame shifting.

I don't say this to be disagreeable. I say this from the perspective of a State that has been hurt by the California electricity crisis. I also say this to make sure that other States do not make the same series of mistakes California made in recent years.

Montana has been hit hard as a result of the California electricity crisis. Montana industrials that gambled on declining future power prices have been hurt by the resulting power prices.

We have seen several closures in Montana, a state whose economic base cannot afford to lose a single job. But, because we are tied into the western grid, any excess energy is pulled to other states and we face higher rates ourselves.

Industries that chose to shop for energy found their traditionally low rates of about \$30 per megawatt rise to as high as \$300. Much of the pain that my State and others have felt could have been avoided if California had not shied away from taking tough decisions when they were called for last year.

Let's review how we got where we are today. California was the first State to open its retail electricity markets to competition in 1996, with Pennsylvania following quickly on its heels. The California electricity law is often described as "deregulation" but it was nothing of the kind.

California did not deregulate electricity markets, but merely exchanged one set of State regulatory rules for another – which led to disaster. We did better in Montana.

The 1996 law had a number of unusual elements. It forced California utilities to divest much of their electricity generation. It required utilities to rely completely on volatile spot markets to buy all their power, something no other State did. It also imposed regulatory rules governing spot market sales that increased wholesale market prices. It froze retail rates.

One provision missing from the 1996 law was reform of the State siting law. California's siting law is the most burdensome in the world. It can take up to seven years to build a power plant in California, and the average period is 4.5 years – nearly twice the average in Texas.

This was a crucial mistake, since California retained a siting process suitable for long-term planning by regulated utilities with 10 or 20 year planning horizons, but completely unsuitable for a competitive market where independent power producers build virtually all power plants using much shorter planning horizons.

The failure to address siting reform was a major mistake. Independent power producers moved quickly to meeting California's growing electricity demand, filing applications to build 14,000 megawatts of new generation beginning in 1997. Because of the failed State siting process, none of these power plants are operating yet. Montana did not make the same mistake. We revised our siting laws to exempt generation facilities.

It is important to note that the supply shortage in California did not occur overnight. It developed over a five-year period when electricity demand rose by 6,300 megawatts. Incredibly, over this same period, electric generating capacity in California actually declined.

As I indicated earlier, California took a big gamble by forcing its utilities to buy all their power through volatile spot markets. It took an even bigger gamble not ensuring that electricity supplies were adequate to meet the needs of consumers and businesses. It does not take a panel of economists to know that supply shortages and spot markets are not a good combination. They produce the sky-high prices that California and the West have been paying for the past year.

California has had price caps for wholesale power sales since 1998. Last year, California experimented with four different price caps: a hard cap of \$750 per megawatt-hour (under a hard cap no sale may take place above the capped price), a hard cap of \$500, a hard cap of \$250, and a soft cap of \$150.

This year, FERC changed tacks, approving price mitigation that reflects gas costs and other costs. That approach seems to be working, and FERC earlier this week expanded the scope of its price mitigation plan.

Price caps exacerbated California's supply problems last year. Since the caps did not apply to Western markets in-State power producers often chose to sell electricity outside California at price higher than the hard cap. As a result, power exports from California rose 85 percent and California's electricity supply fell by 3,000 megawatts.

By the end of the year, when the hard cap had been lowered to \$250, the price cap was seriously exacerbating California's electricity supply problem, since prices in uncapped markets had risen to more than \$400.

Ultimately, California asked to lift the price cap on the grounds that it was causing serious supply problems. On December 8, 2000, the California ISO filed an emergency petition to waive the \$250 hard cap, which FERC approved. At their request, FERC set a soft cap.

Price caps last year also did not control high prices. Each time price caps were lowered, average monthly prices rose. The experience last year showed that price caps failed to control high prices, and exacerbated supply problems.

The lesson California apparently drew from the failure of price caps last year was to expand the scope of price caps to encompass the entire West, notwithstanding the opposition expressed by 8 of the 11 governors in the region.

The main cause of the California electricity crisis is a supply shortage. It is the State's responsibility, not the Federal government's, to license power plants. It has been clear for a long time the State siting process is broken. Although it has made cosmetic changes, the State has shied away from making meaningful reforms to the siting process.

The secondary cause of high prices is the disastrous regulatory rules imposed on the electricity market by the State. Unfortunately, the State has simply refused to act in a timely and effective manner. The California electricity crisis in large part is the result of inaction over a crucial nine-month period after the price spikes and supply shortages began in May 2000. This inaction forfeited the last chance to prevent a crisis.

State rules barred California utilities from recovering wholesale power costs from retail rates, forcing utilities to buy power at 30 cents per kilowatt-hour and resell it for 3 cents. It was those rules – imposed by the State of California – that destroyed the financial health of the utilities and drove Pacific Gas & Electric (PG&E) into bankruptcy.

If the State had allowed cost recovery, the utilities' credit would not have been destroyed, PG&E would not have gone bankrupt, and the State would not be spending its surplus buying electricity and bailing out the very utilities' whose credit it destroyed. The bankruptcy of PG&E could have been avoided if the State had allowed cost recovery.

Perhaps the most serious mistake made by the State was forcing the California utilities to rely entirely on the volatile spot market for all their power, even after wholesale prices had risen ten-fold. If the Governor had allowed the utilities to enter into bilateral contracts last year, electricity prices would be a fraction of what they are now.

Last summer, Duke Energy offered to sell San Diego Gas & Electric power for \$55 per megawatt-hour, a fraction of today's cost. However, the California Public Utilities Commission forced the utilities to continue relying on the spot market. The end result: instead of paying \$55, utilities paid average monthly prices exceeding \$300.

The State only recognized the need for bilateral contracts after the financial health of the utilities was destroyed, and the State assumed the burden of buying power for Californians. Once the State was paying the bills it realized reliance on volatile spot markets was foolish, and began to enter into bilateral contracts.

Ironically, the contract prices California has announced – and much of this remains secret – indicate they agreed to pay up to three times higher than what Duke Energy offered last year.

The State's indecision on raising retail rates was another major mistake -- one that led to higher rate increases than were necessary. Last fall, the utilities requested a modest rate increase. The State refused to consider this proposal, which directly led to the PG&E bankruptcy. In the end, the State ended up approving a much larger rate increase than was necessary if it had acted in a timely and effective manner.

Nine months after the beginning of this crisis, Governor Davis began to take action. In February, he announced an emergency plan to build 5,000 megawatts of new generation by July 1. According to recent reports, only 1,300 megawatts of plants that were under construction before his announcement will be available on that date.

Governor Davis announced a conservation plan to lower demand by 3,000 megawatts. I understand that plan also is falling short, and may produce less than 1,000 megawatts in demand savings. The Governor's plan to restore the financial health of Southern California Edison appears to be languishing in the State legislature. I am glad the State is taking this action, but regret they only acted in response to a crisis, instead of trying to prevent one.

Threats by the Governor and others to seize power plants and impose punitive taxes, which we did not ultimately do in Montana, will discourage what is needed most: investment in new generation. California has seen at least two power plants put on hold because of uncertainty about regulatory stability in California. As one power company put it: "I have more confidence in regulatory stability in Brazil than I do in California."

If the Governor takes such a rash step, investment in new generation in California will come to a complete halt. The State will find itself in the business of generating and transmitting electricity on a permanent basis. The State will continue to spend billions of dollars on electricity instead of on schools. The power plants and transmission infrastructure will slowly degrade.

And California's neighbors – Montana included – will find that they must continue to supply the power that California needs, since California refuses to provide for itself.

The time for blame shifting is over. FERC has taken strong action to mitigate high prices in California. The time has come for the State to buckle down and do its job: ensure adequate electricity supplies for California consumers and businesses.

Thank you.

STATEMENT OF GOV. JOHN HOEVEN
BEFORE THE COMMITTEE ON GOVERNMENTAL
AFFAIRS
UNITED STATES SENATE
ON
THE ROLE OF THE FEDERAL ENERGY REGULATORY
COMMISSION ASSOCIATED WITH THE
RESTRUCTURING OF ENERGY INDUSTRIES

Mr. Chairman, thank you for holding this hearing today. I want to thank you and the other members of this Committee for the opportunity to testify. My comments today will focus on the President's leadership in setting the right direction for energy policy. His plan calls for a market-based approach that will stimulate supply, promote conservation, and enable North Dakota and other states to meet the country's energy needs.

North Dakota exports 75 percent of the electricity generated in our state. We are encouraging the construction of new and efficient generation and the development of environmentally friendly, renewable energy. We have also developed one of only two coal gasification plants in the world.

This diverse and growing energy portfolio will serve North Dakota's needs for a long time into the future, while allowing our excess energy to be exported and help serve other parts of the country. North Dakota is also one of the lowest cost energy producing states in the nation - utilizing coal, natural gas and hydro - a fact we are proud of.

In North Dakota, we have worked hard to ensure we have enough electricity to meet the needs of our consumers and businesses. Our citizens recognize that you cannot maintain economic growth if you lack the electricity infrastructure needed to encourage economic development and continued growth. We also see energy generation as an important job creator for our state's economy while helping to meet a national need.

In order to assure economic growth, our state has a partnership called *VISION 21*, investing \$10 million with any companies that undertake feasibility studies for new clean coal generation plants. This program will seek to access the Clean Coal Program in the President's energy policy, if it is authorized by Congress, creating a federal, state, private sector partnership.

For America to move forward and ensure our energy independence, our federal government must utilize market-based policies that will encourage new and efficient infrastructure. We must stimulate private investment in new generation and transmission in order to develop a vibrant regional wholesale market. To do this, I believe the federal government has two roles. One is leadership and the other is to provide market and regulatory certainty.

The Need for Leadership

President Bush and Vice-President Cheney have shown our nation the leadership necessary to ensure our future energy independence. President Bush has developed a long-term national energy policy, while also directing his

administration to take steps that can help address short-term problems, like that of the California energy crisis

The President's initiatives to help solve the California energy crisis, include:

- Two days after taking office, the Bush Administration extended emergency orders, giving the State time to enact legislation authorizing it to buy power on behalf of Californians.
- A month after taking office, the President issued an executive order directing Federal agencies to expedite permits needed to increase electricity supply in California.

- In order to reduce demand, the President issued an executive order directing Federal facilities in California to maximize conservation this summer.
- At the Governor's request, Secretary Abraham asked FERC to extend a waiver for qualifying facilities from PURPA fuel requirements, a request that FERC granted.
- Four months after taking office, the Administration took the first step towards removing a transmission constraint that has caused repeated blackouts.

For our long-term energy independence the President developed and released the administration's National Energy Policy. Not all of the recommendations are popular, but they all should be considered as part of a comprehensive