

THE ROLE OF TECHNOLOGY IN ACHIEVING A HARD DEADLINE FOR THE DTV TRANSITION

HEARING BEFORE THE SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET OF THE COMMITTEE ON ENERGY AND COMMERCE HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

FEBRUARY 17, 2005

Serial No. 109-9

Printed for the use of the Committee on Energy and Commerce



Available via the World Wide Web: <http://www.access.gpo.gov/congress/house>

U.S. GOVERNMENT PRINTING OFFICE

99-911PDF

WASHINGTON : 2005

For sale by the Superintendent of Documents, U.S. Government Printing Office
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THE ROLE OF TECHNOLOGY IN ACHIEVING A HARD DEADLINE FOR THE DTV TRANSITION

THURSDAY, FEBRUARY 17, 2005

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS
AND THE INTERNET,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:36 a.m., in room 2123 of the Rayburn House Office Building, Hon. Fred Upton (chairman) presiding.

Members present: Representatives Stearns, Whitfield, Shimkus, Wilson, Pickering, Fossella, Radanovich, Bass, Walden, Terry, Ferguson, Sullivan, Blackburn, Barton (ex officio), Markey, Engel, Wynn, Doyle, Gonzalez, Inslee, Boucher, Towns, Brown, and Rush.

Staff present: Howard Waltzman, chief counsel; Will Nordwind, policy coordinator; Neil Fried, majority counsel; Kelly Cole, majority counsel; Jaylyn Jensen, senior research analyst; Billy Harvard, legislative clerk; Johanna Shelton, minority counsel; Peter Filon, minority counsel; Ashley Groesbeck, research assistant; and Turney Hall, staff assistant.

Mr. UPTON. Good morning. Today, we begin the first in a series of hearings this year on the DTV transition as we move with deliberate speed toward the introduction and consideration of legislation to bring the transition to an expeditious end by a date certain so that broadcasters and the analog spectrum can be returned and used for both public safety, interoperable radio communications, and advanced wireless services. And it is my goal to move DTV legislation in a timeframe to enable its consideration on the House floor by early summer.

Today's hearing focuses on the role of technology in helping us achieve a hard deadline for the DTV transition. I would begin by noting that because of current law, Congress did nothing for those 15 percent of American households which rely exclusively on over-the-air television service could see their TV sets go dark at the end of the digital TV transition.

Fortunately, exclusively over-the-air households could use digital to analog converter boxes to ensure that their current analog sets can receive digital broadcast signals. Alternatively, they could purchase a TV with a DTV tuner, subscribe to cable, or subscribe to satellite. We are contemplating in our hard day of legislation the creation of some type of digital to analog converter box program to assist exclusively over-the-air TV households in getting those con-

verter boxes. Such a program could be financed by using a portion of the proceeds from auction of the returned analog spectrum.

Consequently, we need to know how much those converter boxes will cost and when they will be available in mass quantities. I think that that is the right policy direction, but we will need to consider the appropriate scope of such a program and make sure that it is crafted in a way to prevent fraud, abuse, and mismanagement. Technology also enables cable and satellite operators to convert digital signals to analog for those subscribers who have analog TV sets so that those sets will continue to work. However, we need to grapple with the question of whether cable and satellite operators are permitted to convert the broadcasters of digital signal at the head end or at the subscriber's house. The answer to the question may have a dramatic impact on what we will have to do to ensure that their analog TVs continue to work the way that they expect them to work.

I look forward to hearing from today's witnesses on these important issues. I appreciate their willingness to be with us today for sure. And I want to thank the GAO for its tremendous work and competence.

With that, I yield to an opening statement to my friend and colleague, the ranking member of the subcommittee, Mr. Markey from Massachusetts.

Mr. MARKEY. Thank you, Mr. Chairman. Thank you very much for helping us to explore these issues today.

Today's hearing will explore issues related to ending analog television broadcasting in the United States. I think for public policy discussion we can safely assume that the analog era will end on a date certain. This is largely because budgetary interests will force a hard date for shutting down the analog signal in order to obtain proceeds from any auctions for licenses to use frequencies that the broadcast industry vacates.

The question remains which date should be chosen. My feeling is that the date should be driven not by budgetary considerations but rather by our telecommunications policy goals. We must be mindful that television penetration in the United States exceeds telephone penetration. The Government Accountability Office will report to us this morning that some 21 million households in the United States rely exclusively upon free over-the-air analog broadcasting. On average, American consumers also have multiple television sets in their households, and today, all over the country, consumers will be walking into a store and, rather than buying a DTV set, they will buy yet another analog TV set, and these TV sets typically last 15 to 20 years longer, not 18 months, like an iPod, 15 to 20 years. iPod automatically goes broke in 18 months. Isn't that something? That is the new technology. The old technology lasts for 15 to 20 years.

There is little debate that getting the analog TV spectrum backed soon can offer consumers and taxpayers alike important public and economic benefits. More importantly, even freeing up the upper portion of the broadcast spectrum for our public safety would be a significant public interest achievement that has eluded the Federal Communications Commission for several years. At its core, the DTV transition represents a government-driven pol-

icy, not a purely market-driven phenomenon, and it is therefore imperative that government create the conditions and environment for policy success. In that context, any transition plan that abruptly cuts off analog television service must come only after consumers have been adequately informed of the impending shut off of service. Moreover, it should only occur after the government has fully implemented a program to effectively identify individuals who may warrant a subsidy to buy needed equipment so that they do not lose TV reception in their household. And in considering a timetable for this proposed—for this purpose, we must remember that neither the FCC nor the Commerce Department has any experience in administering this type of program.

Finally, a date certain shut off of the analog television feed should arrive only after consumers have had sufficient time to make the purchases they need to continue receiving television broadcasts in the digital TV era. Another intricate component of any early and less costly date certain shut off of the analog signal is the notion that cable operators will take the digital signals of broadcasters and down-convert such signals to analog. In other words, millions of cable consumers would receive their local TV broadcasters in analog format rather than in digital format in order to bring the DTV transition to a more rapid conclusion.

I believe we have to have a discussion of the consumer impact of down-converting a broadcaster's signal. Over the next couple of years, millions of consumers will make investments in digital television equipment. And millions more may be induced to make such purchases if the government is advertising that it is ending the analog TV era on a certain date. If we permit the down-conversion of the quality of the broadcaster's signal in order to end up—in order to end the DTV transition early, will there be any policy of up-conversion of that signal back to its original digital format further down the road so that all cable consumers eventually get to see the digital quality picture the broadcaster is delivering to the cable operator on the new digital set that this committee will have advised all consumers to have purchased although they are now watching an analog set in the digital era in—oh, God, is it going to be confusing.

These are important issues that the subcommittee must understand so that we can explain it to our constituents. And we appreciate all of the expert testimony that we are going to hear today, because Congress is a stimulating—is a stimulus-response institution, and there is nothing more stimulating than millions of consumers who will demand to know why they can't see their favorite programming this coming Sunday. There could never—I can't even imagine the issue that could match it in its intensity if this committee mishandles this issue.

I yield back the balance of my time.

Mr. UPTON. Thank you.

The gentleman from Illinois, Mr. Shimkus, for an opening statement.

Mr. SHIMKUS. Just briefly, Mr. Chairman, let me use this time to welcome at least two of the panelists who are testifying today. We have Mr. James Yager who is testifying on behalf of NAB. He is from Hoffman Estates in Illinois. He was in the Army and owns

a CBS affiliate in Quincy, and I—Quincy was part of my old District, so I know the community well and the broadcast area. And Michael Willner is testifying for cable. He is president of Insight Communications, which has a large presence in central Illinois. So following up on Mr. Markey's comments, there is schizophrenia in the committee room and I welcome two folks who probably have different views on this issue. And we will try to work it out.

I yield back my time, Mr. Chairman.

Mr. UPTON. Thank you.

Mr. Boucher.

Mr. BOUCHER. Well, thank you very much, Mr. Chairman.

I think all of us would welcome an early return of the analog spectrum, which could then be utilized for a variety of valuable communications services. I think that all of us would also agree that the owners of the 73 million analog television sets currently in use in the United States should not find themselves with stranded equipment as a consequence of the digital television transition.

It is a difficult balance to strike, accelerating the digital transition while holding harmless the owners of analog television sets. In these remarks, I want to strike a cautionary note and underscore the difficulty that a hard date for surrender of the analog spectrum could create for analog set owners.

As I indicated, there are 73 million analog sets currently in use in the Nation today. 45 million of these sets are in households that rely solely on over-the-air reception. These 20.5 million households don't have a cable or a satellite subscription. They get their television solely over the air. These 20.5 million households represent some of the most economically challenged residents in our Nation. Many are in less financially fortunate rural areas. 43 percent of the Spanish language households are in over-the-air markets only. 25 percent of households with incomes of less than \$30,000 are over-the-air reliant. I don't think any of us would expect these individuals to bear the burden of a transition that will turn their television sets into scrap metal.

Some have suggested that we use proceeds from the auction of the analog 6 megahertz to purchase converters that would then be given to analog set owners along the lines of the experience that occurred in the city of Berlin. But the math that underlies this suggestion is questionable at best. A \$100 converter box supplied for 73 million television sets would cost \$7.3 billion. The low end of the estimate of the revenue that the government would receive upon the auction of the return of 6 megahertz of analog spectrum is approximately \$4 billion. Even if the converter boxes prove cheaper than \$100, and even if many of the owners of analog sets decide to purchase digital sets, the cost of the converter boxes could well exceed the revenues that the government will get for the auction of the analog spectrum.

And so I urge the members not to rush to judgment and to pose a hard date for analog spectrum surrender. There are other steps that we can take to accelerate the transition, and I will look forward to suggestions this morning from our witnesses about what some of those steps might be.

Thank you very much, Mr. Chairman. I yield back.

Mr. UPTON. Thank you.

Mr. Walden.

Mr. WALDEN. Thank you very much, Mr. Chairman. I appreciate your holding this hearing on this DTV conversion issue, and I want to especially thank our witnesses for their testimony today. I have read the report from the General Accounting—or the Government Accountability Office. I have to keep reminding myself of the name change there. And I appreciate it, because it really lays out, in a very factual context, the kind of TV tax we are looking at here. And I label it there because somewhere between \$463 million and \$10 billion is at issue here.

And for what? I am a Republican. I came here as a Republican. I intend to leave as a Republican, and I think the marketplace is probably the best place to resolve this issue. And consumers aren't exactly ready for this transition and apparently, according to the GAO's report, aren't necessarily embracing what it may cost them. Over time, they will get there, but if we drop this hammer on consumers, the sledgehammer is going to come back on us, as it should. I am concerned about issues relating to down-converting when broadcasters are having to convert their signals to digital only to have the bulk of their audience see it in analog, because there is no requirement on cable to maintain that digital pass-through. And then I don't know how I am going to explain a drop dead date to consumers when they realize the three to five television sets they have in their house no longer will function as of a given date. I know the pushback that is received by us when there is a small add-on fee on a phone bill, for example, of 25 cents a month or something. I hasten to wonder what that feedback will be when that fee is somewhere in the \$50 to \$100 range just to watch TV. And for those who may not have read the constitution lately having gone through the satellite TV issues, I have found this little clause that says being able to watch TV is a constitutional right that we will all hear about.

And so, Mr. Chairman, I appreciate the opportunity to hear from our witnesses today, and I look forward to this vigorous debate.

Mr. UPTON. Mr. Gonzalez.

Mr. GONZALEZ. Thank you. With that comment, Walden for Supreme Court Justice. I like that interpretation.

Mr. WALDEN. Do you have to be a lawyer?

Mr. GONZALEZ. Actually not for the Supreme Court.

Anyway, that is another story.

But thank you very much, Mr. Chairman, and I welcome this opportunity. I don't know what it will take. I am new to the committee. This has been going around for a number of years. How do you bring all of the stakeholders together and respect their interests? Do we ever really get this thing moving? Do we keep talking about it? And have we created something that we don't know what we are going to do? As we get to the end of the road, my suggestion, of course, to get Congress moving is maybe to restrict all political advertising to be digitally transmitted. And we probably would have some real movement.

But again, just thank you. And I look forward to it. My apologies. I may be called to some meetings, and I will try to attend as much of this as possible.

Again, thank you, and I yield back.

Mr. UPTON. Mr. Terry.

Mr. TERRY. Thank you, Mr. Chairman.

I am a strong believer in the digital transition and a firm believer that in order to make this transition a reality, we need to have a hard date. However, we have to realize that there are consequences associated with the transition that we need to vet and fix. I am happy today to see that today's hearing will be the first in a series of hearings to discuss this transition. And I am delighted to see today that we will be focusing on an issue that I think is one of the most important, and that is the technology associated with the conversion.

According to the NAB, as Rick said, 20.5 million U.S. households rely solely on over-the-air broadcasting for their TV viewing. Now we don't know if this is an exact number, but I am going to take it as such. Therefore, we need to realize that there are just a heck of a lot of folks that still get their signal over the air that will be significantly harmed by a hard date.

We also have to focus on those that receive their signal from cable or satellite that have analog sets that will lose their services unless the consumer is provided a converter box where the signal is down-converted at the cable head end. For these consumers, I believe it is up to the provider to figure out how to get them the best quality signal to their customer.

The issue then becomes, of the people who rely solely on over-the-air broadcasting, how does the Federal Government help to get set-top boxes to them, and who do we provide this help to.

One of our witnesses today, LG Electronics, has stated that they believe that the retail price of a simple digital to analog converter box should be under \$100 by 2006 and under \$50 by 2008. But as the price of the set-top box decreases, there are still those that will not be able to afford one, let alone several, at whatever price these boxes are sold at. It is for these people that I think we have an obligation to help and allow them to go to Nebraska Furniture Mart in Omaha, Nebraska, yes, a selfless plug for one of our biggest electronic stores, or Best Buys or other electronic stores in other areas and purchase a set-top box. Maybe under a voucher type of program—there are a number of ways to put a program like this into place that we must explore.

Again, thank you, Mr. Chairman, for holding this hearing. And I look forward to hearing from our witnesses.

[The prepared statement of Hon. Lee Terry follows:]

PREPARED STATEMENT OF HON. LEE TERRY, A REPRESENTATIVE IN CONGRESS FROM
THE STATE OF NEBRASKA

Thank you Mr. Chairman,

Mr. Chairman, like you—I am a strong believer in the Digital Television (DTV) Transition and I am a firm believer that in order to make this transition a reality—we need to have a hard date. While it is commonly understood that this transition will bring a host of benefits to the American Consumer, it is an unfortunate reality that there are many issues we must get through to make this transition as smooth as possible.

I am happy to see that today's hearing will be the first in a series of hearings to discuss the transition and am delighted to see that today we will be focusing on an issue I think is one of the most important—the set-top box.

According to the National Association of Broadcasters there are 20.5 million U.S. television households that rely solely on over-the-air broadcasting for their TV viewing. Whether or not this number is exact—there will still be a lot of homes that will

have to figure out a way to receive a Digital signal once this hard date is established. Additionally, those that receive their signal from cable or satellite and have analog sets will lose service unless the consumer is provided a converter box or the signal is down converted at the cable head-end. For these customers, I believe that it is up to the provider to figure out how to get the best quality signal to their customer.

The issue then becomes—of the people who rely solely on over-the-air broadcasting; how does the Federal Government help get set-top boxes to them, and who do we provide this help to. One of our witnesses today, LG Electronics, has stated that they believe the retail price of a simple digital-to-analog converter box should be under \$100 by 2006 and under \$50 by 2008. But as the price of the set-top box decreases, there are those that will not be able to afford one no matter what the price point. It is these people that we must help and allow them to go to Nebraska Furniture Mart, or their local Best Buy and purchase a set-top box under a voucher program. And while there are a number of ways to put a program like this into place, I think one of the best ways to set it up is to use a portion of the proceeds from the auction of the analog spectrum we will get back once this hard date is reached.

Again, thank you Mr. Chairman for holding this hearing and I look forward to hearing from our witnesses.

Mr. UPTON. Mr. Brown.

Mr. BROWN. Mr. Chairman, I would waive my opening statement.

Mr. UPTON. Thank you.

Mr. Doyle.

Mr. DOYLE. Thank you, Mr. Chairman.

I want to start by thanking you and Mr. Markey for scheduling this important hearing, and I would also like to thank all of the witnesses for agreeing to appear before us today to discuss the numerous issues surrounding a hard deadline for the digital television transition.

Today, only between 8 and 9 percent of Americans are capable of viewing digital television signals. And at the current pace of transition, we are not going to even come close to reaching the 85 percent threshold prior to the December 31, 2006 statutory deadline. So clearly, we must do something to speed up the process.

It seems to me that the certainty of a hard deadline to convert would have this speeding up effect. I guess the question in my mind is regardless of what hard date we choose, exactly what types of things must happen for a hard date to be achievable? Can manufacturers make the set-top boxes we need prior to a hard deadline? And how would the price per unit of each device vary depending on the hard date? Will these devices be considerably cheaper per unit with a later date?

I know we are early in the process, but today's hearing is essential, because in order to meet a hard deadline, we will need the expertise of our witnesses and the industries and interests you represent.

One of my biggest concerns as we navigate this process revolves around the impact the conversion will have on the American people. Millions of Americans simply don't have the disposable income to go out and purchase new hardware in order to watch television. What will be the financial impact on these people? And if we decide to help lower-income Americans afford converter boxes, where do we draw the line? At what point should we start with public outreach so that whatever we decide doesn't blind-side our constituents?

You know, just a few years ago, many of us here on this committee were inundated with angry constituents when 500,000 satellite subscribers lost access to their network TV signal. 500,000, a large number indeed, but when you consider that there are 45 million television sets and homes that rely on free, over-the-air broadcasts, televisions that could be obsolete, I cringe to think of the backlash that would come if we don't get this right, which is why we better get this right, Mr. Chairman.

Thank you very much, and I yield back my time.

[The prepared statement of Hon. Mike Doyle follows:]

PREPARED STATEMENT OF HON. MIKE DOYLE, A REPRESENTATIVE IN CONGRESS FROM
THE STATE OF PENNSYLVANIA

I want to start today by thanking Mr. Upton and Mr. Markey for scheduling this important hearing. I'd also like to thank all of the witnesses for agreeing to appear before us today to discuss the numerous issues surrounding a hard deadline for the digital television transition.

Today, only between 8% and 9% of Americans are capable of viewing digital television signals. And at the current pace of transition, we are not going to come close to reaching the 85% threshold prior to the December 31st 2006 statutory deadline. So clearly we must do something to speed up this process.

It seems to me that the certainty of a hard deadline to convert would have this "speeding up" effect. I guess the question on my mind is, regardless of what hard date we choose, exactly what types of things must happen for a hard date to be achievable? Can manufacturers make the set-top boxes we will need prior to a hard deadline? How would the price per unit of each device vary depending on the hard date? Will these devices be considerably cheaper per unit with a later date? I know we are early in the process, but today's hearing is essential because in order to meet a hard deadline we need the expertise of our witnesses and the industries and interests you represent.

One of my biggest concerns as we navigate this process revolves around the impact this conversion will have on the American people. Millions of Americans simply don't have the disposable income to go out and purchase new hardware in order to watch television. What will the financial impact be on these people? And, if we decide to help lower income Americans afford converter boxes, exactly where do we draw the line in defining low income? And at what point should we start with public outreach so that whatever we decide does not blindside our constituents?

A few years ago, many of us were inundated with calls from angry constituents when 500,000 satellite subscribers lost access to their network TV signals. 500,000—a large number indeed, but when you consider that there are 45 million television sets in homes that rely on free, over-the-air broadcasts—televisions that could be rendered obsolete—I cringe to think of the backlash that will come if we don't get this right.

Which is why we better get this right!

Thank you Mr. Chairman.

Mr. UPTON. Mr. Barton.

Chairman BARTON. Thank you, Mr. Chairman.

I am going to submit my opening statement for the record, but something that is not in the opening statement that I want to put on the record is that in the very near future, I intend to introduce a hard date, stand-alone bill on digital transition, and I hope we can get all of the members of the subcommittee and full committee to be cosponsors.

Thank you.

[The prepared statement of Hon. Joe Barton follows:]

PREPARED STATEMENT OF HON. JOE BARTON, CHAIRMAN, COMMITTEE ON ENERGY
AND COMMERCE

Thank you, Mr. Chairman, for holding this hearing on the role of technology in achieving a hard deadline for the digital television transition. As I have made clear in previous hearings and elsewhere, I intend to introduce DTV hard-deadline legis-

lation this year. We need to expedite the transition so that consumers and the economy can benefit from the full rollout of DTV, and so that we can repurpose the analog spectrum for public safety use and advanced wireless services.

Moreover, unless Congress takes action, current provisions in the Communications Act could cause approximately 15 million households to lose television service. The statute requires local broadcasters to stop broadcasting in analog once 85 percent of their markets have access to digital broadcast channels. The remaining 15 percent of households relying on analog over-the-air signals would then no longer be able to view broadcast programming.

We could address this problem by eliminating the 85-percent penetration requirement and setting a December 31, 2006, "hard deadline" for television broadcasters to cease analog broadcasts. Some of the revenue from auction of the returned spectrum could then be used to create a digital-to-analog converter box program. Such converter boxes can help ensure that analog over-the-air households do not lose television service. Similarly, cable and satellite operators could convert digital broadcasts to analog format for their subscribers with analog televisions. In this way, analog households would continue to get programming, and consumers could upgrade to digital televisions when they are ready.

Clearing the spectrum on an accelerated and nationwide basis with hard-date legislation will raise the money necessary to fund the converter-box program. Without such legislation, the spectrum would remain encumbered for many years and yield far less at auction. We would not have the converter-box program, and millions of analog over-the-air households would go dark under the current law once the 85-percent requirement is met.

On a side but related note, the FCC this week solicited comment on a petition by the consumer electronics industry to modify the digital tuner mandate rules. The consumer electronics industry would like to eliminate one of the July 1, 2005, requirements to include digital tuners in certain televisions in exchange for moving sooner a July 1, 2006, deadline. I will keep an eye on this petition, looking at it from the perspective of whether it will slow or speed the DTV transition.

I thank the witnesses for appearing before the Subcommittee. Their testimony will help us decide how we might craft hard-deadline legislation and a converter box program, and estimate how much it will cost. I yield back.

Mr. UPTON. Ms. Blackburn. Mr. Whitfield.

Mr. WHITFIELD. Waive.

Mr. UPTON. Mr. Stearns.

Mr. STEARNS. Thank you, Mr. Chairman.

I just have a few comments.

I am glad we are having this hearing. I sort of feel like our chairman, Mr. Barton, that a hard date would help us accomplish a lot. I think it would promote certainty in the marketplace. It would also free up spectrum for public safety purposes and also, I think it would accommodate what would be an explosive growth in the next generation of commercial wireless technology and services. So I am an advocate of a hard date if we can move forward. Obviously, this hearing is here because we have a legitimate question whether consumers can fully transition—whether they fully understand this digital transition and its implications. A lot of my District is rural, so the question is how that would impact the rural part of north central Florida.

There are several ways to go about doing this, there's some talk about subsidizing the converter boxes or providing extensive consumer education to help the consumers to understand what is involved. Perhaps—some people have talked about what they did in Germany in Berlin with some type of tax incentive. These are all possible solutions. I would prefer to see the marketplace, but our overriding concern should be how do we get this transition accomplished. I want to make sure older Americans are not overly disrupted by this transition so in the end, we might have to all just move forward with a hard date.

So I look forward to the testimony.
 Thank you, Mr. Chairman.
 [The prepared statement of Hon. Cliff Stearns follows:]

PREPARED STATEMENT OF HON. CLIFFORD STEARNS, A REPRESENTATIVE IN CONGRESS
 FROM THE STATE OF FLORIDA

Thank you, Mr. Chairman.

Today we will be looking into the role of technology in helping achieve a hard deadline for the DTV transition.

Specifically, we'll examine how any proposed digital-to-analog converter boxes or set-top boxes will help ensure that analog, over-the-air households do not lose their television service.

We are looking for a timely and ideally convenient end to the digital transition. A hard date should help accomplish this goal, which will in turn promote certainty and free up spectrum for public safety purposes, as well as accommodate what should be an explosive growth in the next generation of commercial wireless technologies and services.

But there is a legitimate question whether consumers fully understand the DTV transition and its implications, and whether consumers have been purchasing digital television sets at a pace rapid enough to be fully prepared once the December 31, 2006 hard deadline arrives.

These digital offerings are widely available, but consumer demand is not where it should be. For instance, consumers continue to purchase thousands of analog television sets, mainly because the threshold of digital offerings does not appear to be sufficient for the average consumer to cross over and spend that extra money.

In my district, I have many rural and senior constituents who may fall into this category. While I support the hard deadline, I also hope that we can do all that we can to prevent any circumstances that would disenfranchise these over-the-air customers.

It remains to be seen whether this means directly subsidizing these converter boxes, or providing an extensive consumer education effort, or providing some sort of tax incentive like they did in Berlin, or some other potential solution.

In the end, our overriding concern should be how American consumers are affected by this transition. These digital offerings are truly "disruptive technologies," in that they are new advances that will displace analog sets, but we'd all like to make sure that this transition isn't disruptive to the millions of American households won't be fully prepared when the transition ends.

So Mr. Chairman, I look forward to hearing from our panelists today, and to learn how they are proposing to help the American consumer cope with the DTV transition. I appreciate you having this hearing.

Mr. UPTON. Mr. Radanovich. Mr. Bass.

Mr. BASS. Thank you, Mr. Chairman. Thank you for holding this hearing. It is an important issue.

I support a firm deadline for complete digital transition. I am not sure what the right date should be, but sooner, I think, is better than later. We have known for a long time that the end of 2006 is a target date, and it should—nobody should be surprised. Other sign posts, such as the Balanced Budget Act in 1997 and the recent 9/11 Commission report have pointed to this rough timeframe to accomplish the very goals of good stewardship of the public airways, expanding the public safety's interoperability in promoting advanced consumer services. Now if December 2006 is legitimately too soon for many broadcasters or other assets of the regulatory transmission, then I want to reach a consensus on a better date as soon as we can in order to build certainty into the decisionmaking process for consumers.

So with that, I am looking forward to hearing the testimony of our witnesses, and I will yield back.

Mr. UPTON. Mr. Ferguson.

That concludes the opening statements. I thank you all.
 [Additional statements submitted for the record follow:]

PREPARED STATEMENT OF HON. PAUL E. GILLMOR, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF OHIO

Thank you, Mr. Chairman, for this opportunity to discuss technology's role in achieving a hard deadline for the DTV transition, as well as how the transition is progressing and its potential impact on the telecommunications sector and consumers alike.

I had the opportunity to talk about this very issue yesterday morning when I sat down with the general manager of WBGU in Bowling Green, Ohio, the sole public broadcasting station providing quality local, educational and cultural programming to my constituency in rural Northwest Ohio. Of note, he informed me that while digital conversion set-top boxes are available for purchase in selective retail outlets nationwide, they still need to be made more widely available to consumers, and more importantly, at a cheaper price. Currently, when confronted with the decision of whether to buy a DTV conversion box costing hundreds of dollars, a typical patron is likely to either hold off until the boxes go down in value, or continue to delay their decision until they can cough-up enough extra cash to take home a digital television set, leaving their old TV box-less, but otherwise in perfect working order.

Furthermore, as the co-chair of the Congressional Public Broadcasting Caucus, I am happy to report that WBGU is transitioning into our digital world with much success. They are currently multi-casting digital channels, meeting the needs of those who can receive them by dedicating one channel as an all-day safe haven for children as well as providing another channel devoted to broadcasting local and Northwest Ohio programming to the region.

I welcome the well-balanced panel of witnesses, look forward to their testimony on this important issue, and again, thank the Chairman and yield back the remainder of my time.

PREPARED STATEMENT OF HON. BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF WYOMING

Thank you, Mr. Chairman.

I appreciate your efforts to keep the Subcommittee focused on the Digital Television, or DTV, transition. Since our two hearings last year, it appears that the affected stakeholders are starting to share the same opinion—that it is in our country's best interest to transition to digital promptly and predictably.

Besides the obvious benefits to the consumer—that of a clearer, and higher quality picture and more reliable over-the-air reception—transitioning to DTV will also free up precious spectrum for important national interests, like first responders and advanced wireless services. Not to mention provide a windfall to the U.S. Treasury.

The biggest concern to me, however, is how to ensure the estimate 20 million households that receive their TV signal over the air—and are predicted to be unable to view the new digital programming when the transition occurs—can still use their televisions. I am confident that no Member of Congress wants to be responsible for a blank television screen. That's why we need to get solid numbers, and costs, of how we get digital-to-analog converter boxes to these folks so they are not left in the dark.

The December 31, 2006-deadline for the DTV transition is rapidly approaching. This Committee has heard from many panelists on this matter and is seeking to establish a record of deliberation on how to make the transition a success. There are still difficult decisions to be made, and I believe this requires Congressional action. Inaction, and retention of the current statutory framework for Digital Transition could mean that December 31, 2006 could slip to 2010 or later before we reap the benefits of DTV and advanced wireless services.

That's why I look forward to hearing from our distinguished panel on these matters today and want to continue our dialog as we take the next steps in this transition.

I yield back the balance of my time.

PREPARED STATEMENT OF HON. GEORGE RADANOVICH, A REPRESENTATIVE IN
CONGRESS FROM THE STATE OF CALIFORNIA

Mr. Chairman, thank you for holding this hearing today that will allow us to hear testimony about whether attempting to establish a hard deadline for television broadcasters to end the transmission of analog television signals is economically and technologically feasible and whether it is good public policy.

As many of you are aware, the concept of digital television has been progressing since the 1980's. What began as a concept has evolved into a statutory requirement in which television broadcasters must return one of two channels, that the FCC licensed each eligible broadcaster, on January 31, 2006 unless less than 85% of the viewers in a market can not receive a digital signal from each TV station in that market. The statutory 85% penetration test is the key to completing the transition to digital television and critical to freeing valuable spectrum that will be auctioned off for advanced commercial wireless services and used by public safety entities that are in desperate need of additional spectrum.

During the past two decades a great deal of time, energy and resources has been expended in the effort to transition television broadcasting to digital technology. In the past five years alone, broadcasters have built and are now operating digital television facilities, cable operators have spent tens of billions of dollars upgrading their systems to digital, and consumer electronics manufacturers have developed digital television sets that are more affordable to the average consumer. However, in order to ensure that all of these parties get a return on their investments, we need to make sure that our constituents, the American consumers, also receive some benefit.

I hope that today's witnesses will provide the information that we will need to determine how we can complete the transition to digital television in a manner in which all parties involved will receive the benefits of converting to digital technology; this includes, consumers, broadcasters, cable and satellite providers, public safety entities and new wireless services providers. Since Congress is mandating the conversion to digital television, I believe that we also have an obligation to ensure that no Americans get left in the dark as a result of a hard deadline. Therefore, I look forward to hearing about the technology and economic cost associated with making this a reality. Additionally, I would like to learn more about how establishing a hard deadline is necessary and will be a good policy decision.

Thank you Mr. Chairman.

PREPARED STATEMENT OF HON. MIKE FERGUSON, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF NEW JERSEY

Chairman Upton, as a new member of the telecommunications subcommittee, I am looking forward to working with my colleagues on a whole range of issues that will affect not only the communications industry as a whole, but just as much the American consumer—our constituents. Among those issues, the Digital Television conversion is among the most exciting and challenging we will consider this Congress.

DTV is arguably the most significant development of television technology since the American public was introduced to color television in the 1950's. DTV will allow consumers to experience television like never before, from sharp, realistic pictures to CD quality sound.

However, with the anticipation of DTV in our living rooms, comes the question of how we make as smooth a transition as possible. As we meet our responsibility of setting a hard transition deadline, we must also ensure that those consumers with standard, analog TV's continue to have uninterrupted access to their television service.

I look forward to hearing the testimony of the GAO regarding the potential costs of the transition to the federal government, the view from the private sector, as well as the perspectives of two groups with major roles in this debate, the broadcast and cable industry. Determining the costs and options available to the American public is a critical to achieving a successful and timely DTV transition, and your input is valuable as we move forward. Thank you Mr. Chairman.

PREPARED STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF ILLINOIS

Mr. Chairman, it seems that the transition from analog to digital is finally here. I think we all can agree that a hard date is necessary for the timely and successful DTV transition. But in setting this hard deadline we must ensure that the remaining 21 percent of the American population that rely on analog over the air broadcast do not lose television service simply because they cannot afford to buy a set-top box.

As you know the GAO conducted a study and found that on the average over the air households are likely to have lower incomes compared to cable and DBS households. In addition, over the air households are likely to be non-white and Hispanic households.

There are many lingering issues that must be iron out before DTV transition can be a success. For example, questions still remain as to how much will a set-top box cost. Will there be a subsidy, how will this subsidy be administered and who will qualify for this subsidy. Also, will a means test be employed. Nevertheless, I must point out that as we move forward with the digital transition, I strongly believe that we should require warning labels on analog-only sets, alerting consumers to the limited useful life of their television sets.

On that point, I look forward to hearing from our distinguished panelists regarding this very important issue.

Thank you Mr. Chairman

Mr. UPTON. Gentlemen, we are delighted that you are here. We are joined by Mr. Mark Goldstein, Director of the Physical Infrastructure Issues from the Government Accountability Office, Dr. Jong Kim, Vice President in Public Affairs and Communications for LG Electronics, Mr. James Yager, CEO of Barrington Broadcasting Company, Illinois on behalf of the National Association of Broadcasters, and Mr. Michael Willner, President and CEO of Insight Communications.

Gentlemen, we appreciate you submitting your testimony early. We had a chance to review it last night. Your testimony is made part of the record in its entirety, and we would like you, at this point, to summarize and to keep your remarks to no more than 5 minutes.

Mr. Goldstein, we are just going into session, we will begin with you. Why don't you wait until this long buzzer is completed?

Thank you.

STATEMENTS OF MARK L. GOLDSTEIN, DIRECTOR, PHYSICAL INFRASTRUCTURE ISSUES, GOVERNMENT ACCOUNTABILITY OFFICE; JONG KIM, VICE PRESIDENT, PUBLIC AFFAIRS AND COMMUNICATIONS, LG ELECTRONICS USA, INC.; K. JAMES YAGER, CHIEF EXECUTIVE OFFICER, BARRINGTON BROADCASTING COMPANY, LLC, ON BEHALF OF ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC., NATIONAL ASSOCIATION OF BROADCASTERS; AND MICHAEL S. WILLNER, PRESIDENT AND CHIEF EXECUTIVE OFFICER, INSIGHT COMMUNICATIONS

Mr. GOLDSTEIN. Thank you, Mr. Chairman, and members of the subcommittee.

I am pleased to be here today to report on our work on the potential cost of providing a subsidy to consumers for the purchase of set-top boxes in order to accelerate the DTV transition. As you know, the return of radio frequency spectrum at the end of the transition will provide many benefits to society, such as easing the spectrum scarcity facing public safety providers, engendering economic growth and consumer value from spectrum redeployed to wireless services, and affording the Federal Government revenues from the proceeds of a spectrum auction.

Stations' analog licenses are mandated to terminate in December of 2006, or when 85 percent of households in each market can receive digital broadcast signals, whichever is later. In order to spur households' adoption of the digital equipment, some have suggested that the government subsidize the purchase of set-top boxes that can receive digital broadcast television signals and convert them into analog signals for displaying on existing television sets.

Today I provide cost estimates for a possible subsidy program under various scenarios, but I would like to note that in providing these cost estimates, GAO is not taking a position on the subsidy policy option.

To undertake this work, we purchased data on household television characteristics from a survey research firm and gathered information about the likely cost of set-top boxes from several consumer electronics firms and experts. My statement will summarize our preliminary findings.

First, we found that 19 percent of American households rely exclusively on over-the-air transmissions for their television viewing, and nearly all other households view television through a cable or DBS service. We recognize that others have estimated a lower value for the percent of households relying on the over-the-air television, but we estimated with 95 percent certainty that between 17 and 21 percent of households rely on over-the-air television. On average, over-the-air households are more likely to have lower incomes compared to cable or DBS households. While we found that 29 percent of cable and DBS households had incomes under \$30,000, roughly 48 percent of over-the-air homes had household incomes less than that level. Additionally, we found that non-white and Hispanic households are more likely to rely on over-the-air television than our white and non-Hispanic households.

Two, the specific equipment needs for each household to transition to DTV depends on certain key factors. First, the method through which a household watches television and whether it has already upgraded its television equipment to be compatible with digital television will factor into the equipment needs of the household. Additionally, certain regulatory decisions will play a role in determining some consumers' equipment needs. We examined two key cases.

In case one, we assume that cable and DBS providers would initially down-convert broadcasters' digital signals to a format the viewer—viewable on their subscribers' existing equipment before the signals are transmitted to those subscribers. That is, cable providers would initially down-convert broadcasters' high-definition signals to an analog format before they are transmitted to their subscribers. Similarly, DBS providers would initially down-convert broadcasters' high-definition digital signals to a standard definition digital format before they are transmitted to their subscribers. In this case, only households viewing television using an over-the-air antenna must take action to be able to view broadcasters' digital signals. Case one is similar to the Berlin model for DTV transition.

In case two, we assume that cable and DBS providers would be required to provide broadcasters' digital signals to subscribers in substantially the same format as broadcasters transmitted those signals. Because some of the broadcasters' digital transmissions are in a high-definition digital format, the second case would require cable and DBS providers to transmit the signals in this format to their subscribers, which, in turn, would require cable and DBS subscribers to have equipment in place or to acquire new equipment that can receive their providers' high-definition digital signals. The second case would also require, as in case one, that all over-the-air households acquire new equipment, also.

Three, if the subsidy for set-top boxes were needed only for over-the-air households, our case one scenario, we estimate that it could cost in a range from about \$460 million to about \$2 billion. The subsidy cost varies depending on the price for the set-top boxes and whether a means test, which would limit eligibility for the subsidy to only those households with incomes lower than a specified level, were employed. However, if cable and satellite subscribers also needed new equipment and the subsidy provides some support for those households as well, which is our case two scenario, the overall cost of the program would grow. We estimated that in this case the cost of providing the subsidy could range from about \$1.8 billion to over \$10 billion, depending, again, on the price of the set-top boxes and whether a means test were employed. Each of these subsidy scenarios assumes that only one television per household was subsidized.

There are two issues that stand as important caveats to the analyses that we have presented.

First, we based the majority of the analyses on survey results that provide information on the status of American television households as of early 2004, but over the next few years, the purchase of DTV equipment could obviate the need for certain households to receive a subsidy for new television equipment. Second, these subsidy estimates do not include any costs associated with implementing a subsidy program.

Our work on the DTV transition continues for this committee, and we will provide more information in our report later this year.

Mr. Chairman, this concludes my prepared statement. I will be happy to respond to any questions that you and members have.

[The prepared statement of Mark L. Goldstein follows:]

PREPARED STATEMENT OF MARK L. GOLDSTEIN, DIRECTOR, PHYSICAL
INFRASTRUCTURE ISSUES, UNITED STATES GOVERNMENT ACCOUNTABILITY OFFICE

Mr. Chairman and Members of the Subcommittee: I am pleased to be here today to report on our work on the potential cost of providing a subsidy to consumers for the purchase of set-top boxes in order to accelerate the transition from analog to digital broadcast television. This transition—known as the DTV transition—offers the promise of more programming options, interactive services, and high-definition television (HDTV). Moreover, the return of radiofrequency spectrum used for analog broadcast television at the end of the transition will provide many benefits to society, such as easing the spectrum scarcity facing public safety first responders, engendering economic growth and consumer value from spectrum redeployed to wireless services, and affording the federal government revenues from the proceeds of a spectrum auction. To facilitate the transition, the Congress and the Federal Communications Commission (FCC) temporarily provided television stations nationwide with additional spectrum so that stations could simultaneously broadcast both an analog and a digital signal. Stations' analog licenses are mandated to terminate in December 2006, or when 85 percent of households in each market can receive digital broadcast signals, whichever is later.¹ While the purchase of digital televisions is steadily increasing, it nevertheless appears unlikely that a sufficient proportion of households will have digital television equipment in place by the end of 2006.

In order to spur households' adoption of the digital equipment necessary for the transition, some have suggested that the government provide a subsidy to certain households to purchase a device, known as a set-top box, that can receive digital broadcast television signals and convert them into analog signals so that they can be displayed on *existing* television sets. This device would enable the household to view digital broadcast signals without purchasing a digital television set; such sets

¹ Additional requirements include (1) television stations affiliated with the four largest national networks (ABC, CBS, Fox, and NBC) are broadcasting a DTV signal and (2) the technology to convert a digital signal for use on an analog television set is generally available.

currently sell at considerably higher prices than traditional analog television sets. Aiding in the deployment of set-top boxes may enable the transition to end sooner than it might otherwise by increasing the number of households that can view digital broadcast signals.

At the request of this subcommittee, we have examined (1) the current distribution of American households by television viewing methods and whether there are demographic differences among these groups; (2) the equipment required for households to receive digital broadcast signals; and (3) the estimated cost to the federal government, under various scenarios, of providing a subsidy for set-top boxes that would enable households to view digital broadcast signals. In addition to information provided in this testimony, we are conducting additional work on the DTV transition, subsidy options, and administrative approaches for implementing a subsidy program, and will provide a more detailed study for the Committee and the Subcommittee later this year.

While a subsidy for set-top boxes may be one policy option to spur the transition, there are other policies that might do so as well. In our statement today, we provide cost estimates for a possible subsidy program under various scenarios. We note, however, that in providing these cost estimates, GAO is taking no position on this policy option. We are merely providing, as requested by the Committee and the Subcommittee, cost estimates for such a program.

To address the issues we will discuss today, we purchased data from Knowledge Networks, a survey research firm that had conducted a consumer survey on household television characteristics. The survey provided the responses of 2,471 randomly selected American households and covers such topics as the method each household uses to view television (e.g., cable, over the air), how many television sets they have, and whether they have set-top boxes for digital cable service. The survey also provides information on an array of demographic characteristics for each household. These data were collected between February and April 2004. The response rate for Knowledge Network's survey was 47 percent. The relevance of the response rate for the study's findings is discussed in appendix I.² Using a 95 percent confidence interval, all percentage estimates from the survey have margins of error of plus or minus 6 percentage points or less, and all cost estimates based on the survey data have margins of error of plus or minus 16 percent or less. To assess the reliability of these survey data, we reviewed documentation of survey procedures provided by Knowledge Networks and questioned knowledgeable officials about the survey process and resulting data. We determined that the data were sufficiently reliable for the purposes of this testimony. We also contracted with Knowledge Networks to recontact some of respondents to its survey to ask additional questions that GAO developed.³ Because the number of recontacted households for the additional questions requested by GAO was small, the findings for these questions are not generalizable to a larger population. To gather information about the likely costs of set-top boxes, we interviewed several consumer electronics firms and experts.

The estimate of the potential cost of a subsidy that we are providing should not be interpreted as the cost of a government program. In preparing these estimates we discussed the nature of our work with Congressional Budget Office (CBO). If the Congress considers legislation for a set-top box subsidy program, the CBO will, based on the specifics of the law, prepare an estimate of the cost of the program. We conducted our work from August 2004 to January 2005 in accordance with generally accepted government auditing standards.

We provided a draft of this testimony to the Federal Communications Commission (FCC) for their review and comment. FCC staff provided technical comments that we incorporated where appropriate.

In summary:

The three primary means through which Americans view television signals are over the air, cable, and direct broadcast satellite (DBS). We found that 19 percent, or roughly 21 million American households, rely exclusively on over-the-air transmissions for their television viewing; 57 percent, or nearly 64 million American households, view television via a cable service; and about 19 percent, or about 22 million American households, have a subscription to a DBS service.⁴ We recognize

²Because we did not have information on those contacted who chose not to participate in the survey, we could not estimate the impact of the nonresponse on our results. However, distributions of selected household characteristics (including presence of children, race, and household income) for the sample and the U.S. Census estimate of households show a similar pattern.

³The additional questions were related to why the household chose to view television as they currently do and whether they are likely to make changes in the viewing methods in the near future.

⁴These percentages do not add up to 100 percent because (1) between 1 and 2 percent of American households do not have a television, (2) about 1 percent of households receive tele-

that others have estimated a lower value for the percent of households relying on over the air television.⁵ Our results were derived from a survey of over 2,400 households, from which we estimated with 95 percent certainty that between 17 and 21 percent of households rely on over the air television. On average, over-the-air households are more likely to have lower incomes compared to cable or DBS households. While 48 percent of over-the-air households have incomes under \$30,000,⁶ roughly 29 percent of both cable and satellite homes had household incomes less than or equal to that level. Also, only 6 percent of over-the-air households had incomes over \$100,000, while about 13 percent of cable and satellite households had incomes exceeding \$100,000. Additionally, non-white and Hispanic households are more likely to rely on over-the-air television than are white and non-Hispanic households.

The specific equipment needs for each household to transition to DTV—that is, to be able to view broadcast digital signals—depends on certain key factors. First, the method through which a household watches television and whether it has already upgraded its television equipment to be compatible with digital television, will factor into the equipment needs of the household. Additionally, certain regulatory decisions yet to be made by FCC will play a role in determining some consumers' equipment needs. We examined two key cases regarding the regulatory decisions.

In case one, we assume that cable and DBS providers would continue providing broadcasters' signals as they currently do, thus eliminating any need for their subscribers to acquire new equipment. That is, cable providers would initially "downconvert"⁷ broadcasters' high-definition digital signals to an analog format before they are transmitted to their subscribers. Similarly, DBS providers would initially downconvert broadcasters' high-definition digital signals to a standard-definition digital format before they are transmitted to their subscribers. This enables the signals to be viewed on subscribers' existing televisions sets. In this case, only households viewing television using only an over-the-air antenna must take action to be able to view broadcasters' digital signals.

In case two, we assume that cable and DBS providers would be required to provide broadcasters' digital signals to subscribers in substantially the same format as broadcasters transmitted those signals. Because some of the broadcasters' digital transmissions are in a high-definition digital format, the second case would require cable and DBS providers to transmit the signals in this format to their subscribers. To be able to view these signals, cable and DBS subscribers would need to have equipment in place, or to acquire new equipment, that can receive their providers' high-definition digital signals. The second case would also require, as does case one, all over-the-air households to acquire new equipment.

If a subsidy for set-top boxes were needed only for over-the-air households, we estimate that its cost could range from about \$460 million to about \$2 billion. The subsidy cost varies depending on the price of the set-top boxes and whether a means test—which would limit eligibility for the subsidy to only those households with incomes lower than some specified limit—were employed. However, if cable and satellite subscribers also needed new equipment and the subsidy provides some support for these households as well, the overall cost of the program would grow. We estimate that in this case, the cost of providing the subsidy could range from about \$1.8 billion to over \$10 billion, depending, again, on the price of the set-top boxes and whether a means test were employed.

BACKGROUND

The United States is currently undergoing a transition from analog to digital broadcast television. With traditional analog technology, pictures and sounds are converted into "waveform" electrical signals for transmission through the radio-frequency spectrum, while digital technology converts these pictures and sounds into a stream of digits consisting of zeros and ones for transmission. Digital transmission of television signals provides several advantages compared to analog transmission,

vision service through other means, such as a wireless cable system, and (3) the numbers reported here do not include close to 3 percent of households that reported having a subscription to both cable and DBS.

⁵In its most recent report on video competition, FCC found that number of households subscribing to a multichannel video provider, such as a cable or DBS company, was approximately 85 percent of television households, thus implying that about 15 percent of television households rely on over-the-air television. The methodology employed by FCC differed from the household survey used to prepare our estimate.

⁶For a family of four, the poverty level is just under \$19,000, so the \$30,000 income level would correspond to about 160 percent of the 2004 poverty level for a family of four. The cutoff for eligibility for food stamps is 175 percent of the poverty level.

⁷The word "downconvert" means to take a signal in a given format and transform it into a lower-resolution format.

such as enabling better quality picture and sound reception as well as using the radiofrequency spectrum more efficiently than analog transmission. This increased efficiency makes multicasting—where several digital television signals are transmitted in the same amount of spectrum necessary for one analog television signal—and HDTV⁸ services possible.

A primary goal of the DTV transition is for the federal government to reclaim spectrum that broadcasters currently use to provide analog television signals. The radiofrequency spectrum is a medium that enables many forms of wireless communications, such as mobile telephone, paging, broadcast television and radio, private radio systems, and satellite services. Because of the virtual explosion of wireless applications in recent years, there is considerable concern that future spectrum needs—both for commercial as well as government purposes—will not be met. The spectrum that will be cleared at the end of the DTV transition is considered highly valuable spectrum because of its particular technical properties. In all, the DTV transition will clear 108 megahertz of spectrum—a fairly significant amount. In the Balanced Budget Act of 1997, the Congress directed FCC to reallocate 24 MHz of the reclaimed spectrum to public safety uses. Since the terrorist attacks of September 11, 2001, there has been a greater sense of urgency to free spectrum for public safety purposes. The remaining returned spectrum will be auctioned for use in advanced wireless services, such as wireless high-speed Internet access.⁹

To implement the DTV transition, television stations must provide a digital signal, which requires them to upgrade their transmission facilities, such as transmission lines, antennas, and digital transmitters and encoders. Depending on individual station's tower configuration, the digital conversion may require new towers or upgrades to existing towers. Most television stations throughout the country are now providing a digital broadcast signal in addition to their analog signal. After 2006, the transition will end in each market—that is, analog signals will no longer be provided—when at least 85 percent of households have the ability to receive digital broadcast signals.

AMERICANS WATCH TELEVISION THROUGH THREE PRIMARY MODES

The three primary means through which Americans view television signals are over the air, cable, and direct broadcast satellite (DBS). Over-the-air broadcast television, which began around 1940, uses radiofrequencies to transmit television signals from stations' television towers to households' television antennas mounted on rooftops, in attics, or directly on television sets. Over-the-air television is a free service. Cable television service, a pay television service, emerged in the late 1940s to fill a need for television service in areas with poor over-the-air reception, such as mountainous or remote areas. Cable providers run localized networks of cable lines that deliver television signals from cable facilities to subscribers' homes.¹⁰ Cable operators provide their subscribers with, on average, approximately 73 analog television channels and 150 digital television channels. In 1994, a third primary means of providing television emerged: direct broadcast satellite (DBS). Subscribers to DBS service use small reception dishes that can be mounted on rooftops or windowsills to receive television programming beamed down from satellites that orbit over the equator. Like cable, DBS service is a subscription television service that provides consumers with many channels of programming. When the Congress enacted the Satellite Home Viewer Improvement Act of 1999, it allowed DBS carriers to provide local broadcast signals—such as the local affiliate of ABC or NBC—which they had previously not generally been able to provide.

Over-the-Air Households. We found that 19 percent, or 20.8 million American households, rely exclusively on over-the-air transmissions for their television viewing. We recognize that others have estimated a lower value for the percent of households relying on over the air television. Our results were derived from a survey of over 2,400 households, from which we estimated with 95 percent certainty that between 17 and 21 percent of households rely on over the air television. Compared to households that purchase a subscription to cable or DBS service, we found that exclusive over-the-air viewers are somewhat different demographically. Overall,

⁸HD television provides roughly twice as many lines of resolution, creating a television picture that is much sharper than traditional analog television pictures. HD television can also provide CD-quality sound and is in "widescreen" format, with display screen ratios similar to a movie theater.

⁹Some of this spectrum—24 MHz—has already been auctioned.

¹⁰When cable service first emerged, it was simply a service that provided a wire-based delivery of broadcast, or traditional television stations' signals, but by the late 1970s, cable operators began to provide new networks that were only available through a pay television service, such as HBO, Showtime, and ESPN.

over-the-air households are more likely to have lower incomes than cable or satellite households. Approximately 48 percent of exclusive over-the-air viewers have household incomes less than \$30,000, and 6 percent have household incomes over \$100,000. Additionally, nonwhite and Hispanic households are more likely to rely on over-the-air television than are white and non-Hispanic households; over 23 percent of non-white households rely on over-the-air television compared to less than 16 percent of white households, and about 28 percent of Hispanic households rely on over-the-air television compared to about 17 percent of non-Hispanic households. Finally, we found that, on average, exclusive over-the-air households have 2.1 televisions, which is lower than the average for cable and satellite households.

We asked the survey research firm to recontact approximately 100 of the respondents who exclusively watch television through over-the-air transmission to ask additional questions, including the primary reason the household does not purchase a subscription video service.¹¹ Forty-one of these respondents said that it was too costly for them to purchase a subscription video service, and 44 said that they do not watch enough television to warrant paying for television service. Most of the recontacted households seemed unlikely to purchase a subscription service in the near future. Only 18 of the recontacted households said that they would be likely to purchase a subscription video service in the near future, and another 10 said that they might do so.

Cable Households. We found that 57 percent, or 63.7 million American households, view television through a cable service. On average, cable households have 2.7 television sets. Sixteen percent of cable households have at least one television set in the home that is not connected to cable but instead receives only over-the-air television signals. Of the cable households surveyed, roughly 29 percent had household incomes of less than or equal to \$30,000, and about 13 percent had incomes exceeding \$100,000. We also found that 44 percent of the cable homes have at least one set-top box. Of those cable subscribers with a set-top box, about 67 percent reported that their box is capable of viewing channels the cable system sells on “digital cable tiers,” meaning that the channels are transmitted by their cable provider in a digital format. A subset of these “digital cable” customers have a special set-top box capable of receiving their providers’ transmission of *high-definition* digital signals.

Because the existence of a set-top box in the home may be relevant for determining what equipment households would need to view broadcast digital television signals, we asked the survey research firm to recontact approximately 100 cable households that *do not have a set-top box* to ask questions about their likely purchase of digital cable tiers—which require a set-top box—in the near future.¹² First, we asked the primary reason why the household did not currently purchase any cable digital tiers of programming. Fifty-one of the recontacted respondents said that they did not want to bear the extra expense of digital tiers of cable programming, and 33 said that they did not watch enough television to justify purchasing digital cable service. Only 9 of the recontacted respondents said that they would be likely to purchase digital cable service in the near future, and another 9 said that they might purchase such service in the near future. Finally, we asked these respondents whether they would be reluctant to change their service in any way that would require them to use a set-top box. Of the recontacted respondents, 37 said they would be very reluctant to change their service in a way that would require them to use a set-top box, and another 38 said that they would be somewhat reluctant to do so.

DBS Households. We found that about 19 percent, or 21.7 million American households, have a subscription to a DBS service. These households have, on average, 2.7 television sets. About one-third of these households have at least one television set that is not hooked to their DBS dish and only receives over-the-air television signals. In terms of income, 29 percent of DBS subscribers have incomes less than or equal to \$30,000, and 13 percent have incomes exceeding \$100,000.

One important difference between cable and DBS service is that not all DBS subscribers have the option of viewing local broadcast signals through their DBS provider.¹³ Although the DBS providers have been rolling out local broadcast stations in many markets around the country in the past few years, not all markets are served. DBS subscribers in markets without local broadcast signals available through their DBS provider usually obtain their local broadcast signals through an

¹¹ The actual recontacted number was 102.

¹² The firm actually recontacted 102 such households.

¹³ While cable providers are generally required to provide the local broadcast signals in each market, DBS providers are required to provide all local broadcast stations in markets where they provide any of those stations.

over-the-air antenna, or through a cable connection. This is important to the DTV transition because how households with DBS service view their local broadcast channels will play into the determination of their requirements to transition to broadcast DTV. We therefore requested that the survey research firm recontact approximately 100 DBS customers to ask how they receive their local broadcast channels.¹⁴ We found that when local channels are available to DBS subscribers, they are very likely to purchase those channels. Well more than half of the DBS subscribers who were recontacted viewed their local broadcast channels through their DBS service. Nearly one-fourth of the recontacted DBS subscribers view their local broadcast channels through free over-the-air television. As DBS providers continue to roll out local channels to more markets, the percentage of DBS subscribers relying on over-the-air transmissions to view local signals will likely decline.

HOUSEHOLDS' EQUIPMENT NEEDS FOR DTV TRANSITION WILL DEPEND ON THEIR MODE OF TELEVISION VIEWING AND CURRENT EQUIPMENT STATUS, AND WILL ALSO BE AFFECTED BY REGULATORY DECISIONS

The specific equipment needs for each household to transition to DTV—that is, to be able to view broadcast digital signals—depends on certain key factors: the method through which a household watches television, the television equipment the household currently has, and certain critical regulatory decisions yet to be made. In this section we discuss two cases regarding a key regulatory decision that will need to be made and the implications that decision will have on households' DTV equipment needs.

Before turning to the two cases, a key assumption underlying this analysis must be discussed. Currently, broadcasters have a right to insist that cable providers carry their analog television signals. This is known as the “must carry” rule, and dates to the Cable Television Consumer Protection and Competition Act of 1992. FCC made a determination that these must carry rules will apply to the digital local broadcast signals once a station is no longer transmitting an analog signal. In our analysis, we assume that the must carry right applies to broadcasters' digital signals, and as such, cable providers are generally carrying those signals. DBS providers face some must carry rules as well, although they are different in some key respects from the requirements that apply to cable providers. For the purposes of this analysis, we assume that to the extent that DBS providers face must carry requirements, those requirements apply to the digital broadcast signals.

For nearly all cable subscribers, and more than half of the DBS subscribers, local broadcast analog signals are provided by their subscription television provider. This means that these providers capture the broadcasters' signals through an antenna or a wire and retransmit those signals by cable or DBS to subscribers. We make two disparate assumptions, which we call case one and case two, about how cable and DBS providers might provide digital broadcast signals to subscribers. We do not suggest that these are the only two possibilities regarding how the requirements for carriage of broadcast signals might ultimately be decided—these are simply two possible scenarios.

Case One. In this case, we assume that cable and DBS providers will continue providing broadcasters' signals as they currently do. This assumption would be realized if cable and DBS providers initially downconvert broadcasters' digital signals at the *providers' facilities*, which may require legislative or regulatory action. That is, cable providers would initially downconvert broadcasters' high-definition digital signals to an analog format before they are transmitted to their subscribers. Similarly, DBS providers would initially downconvert broadcasters' high-definition digital signals to a standard-definition digital format before they are transmitted to their subscribers. In this case, there would be no need for cable and DBS subscribers to acquire new equipment; only households viewing television using only an over-the-air antenna must take action to be able to view broadcasters' digital signals. This case shares many attributes with the recently-completed DTV transition in Berlin, Germany.

All over-the-air households—which account for approximately 21 million households in the United States—must do one of two things to be able to view digital broadcast signals.¹⁵ First, they could purchase a digital television set that includes a tuner capable of receiving, processing, and displaying a digital signal. The survey data we used indicated that only about 1 percent of over-the-air viewers have, as of now, purchased a digital television that contains a tuner. However, some large

¹⁴They actually recontacted 102 such households.

¹⁵Additionally, these households could also choose to subscribe to cable or DBS service to eliminate the need to acquire additional equipment to view a television signal over the air.

televisions sold today are required to include such a tuner and by July 2007, all television sets larger than 13 inches are required to include a tuner. After that time, consumers who purchase new television sets will automatically have the capability of viewing digital signals. Approximately 25 to 30 million new television sets are purchased each year in the United States. The second option available to over-the-air households is to purchase a digital-to-analog set-top box. That is, for those households that have not purchased a new television set, the set-top box will convert the digital broadcast signals to analog so that they can be viewed on an existing analog television set. Viewers with digital-to-analog set-top boxes would not actually see the broadcast digital signal in a digital format, but would be viewing that signal after it has been downconverted, by the set-top box, to be compatible with their existing analog television set. Currently, simple set-top boxes that only have the function of downconverting digital signals to analog are not on the market. More complex boxes that include a variety of functions and features, including digital to analog downconversion, are available, but at a substantial cost. However, manufacturers told us that simple, and less expensive, set-top boxes would come to the market when a demand for them develops.

Case Two. In the second case, we assume that cable and DBS companies would be required to provide the broadcasters' signals to their subscribers in substantially the same format as it was received from the broadcasters. Because some of the broadcasters' signals are in a high-definition digital format, cable and DBS subscribers—just like over-the-air households—would need to have the equipment in place to be able to receive high-definition digital signals. There are several ways these subscribers could view these signals:

- Cable or DBS subscribers would be able to view digital broadcast television if they have purchased a digital television set with an over-the-air digital tuner. They would then have the capability of viewing local digital broadcast stations through a traditional television antenna—just like an over-the-air viewer. However, many cable and DBS households may want to continue to view broadcast television signals through their cable or DBS provider.
- Cable or DBS subscribers could purchase a digital television with a “cable card” slot. By inserting a “card” provided by the cable company into such a television, subscribers can receive and display the digital content transmitted by the cable provider. Only very recently, however, have cable-ready digital television sets—which allow cable subscribers to receive their providers' digital signals directly into the television set—come to the market. Similar televisions sets with built-in tuners for satellite digital signals are not currently on the market.
- To view the high-definition signals transmitted by their subscription provider, the other possibility for cable and DBS households would be to have a set-top box that downconverts the signals so that they can be displayed on their existing analog television sets. That is, any downconversion in this scenario takes place at the *subscribers' household*, as opposed to the subscription television providers' facilities, as in case one. While all DBS subscribers and about a third of cable subscribers have set-top boxes that enable a digital signal from their provider to be converted to an analog signal for display on existing television sets, few of these set-top boxes are designed for handling *high-definition* digital signals. As such, if broadcasters' signals are transmitted by cable and DBS providers in a high-definition format, not all cable and satellite subscribers would need new equipment, although most would. In case two, as in case one, all exclusively over-the-air households need a digital television set or a set-top box.

COST OF FEDERAL SUBSIDY FOR SET-TOP BOXES VARIES CONSIDERABLY, DEPENDING ON SEVERAL FACTORS

In this section we present the estimated cost of providing a subsidy to consumers for the purchase of a set-top box that would be designed to advance the digital television transition. The estimated subsidy costs presented here vary based on (1) the two cases discussed above about whether cable and DBS providers initially downconvert broadcasters' digital signals at their facilities before transmitting them to subscribers; (2) varied assumptions about whether a means test is imposed and, if so, at what level; and (3) the expected cost of a simple digital-to-analog set-top box. All of the estimates presented here assume that only one television set is subsidized in each household that is determined to be eligible for the subsidy.¹⁶

Means test. Imposing a means test would limit the subsidy to only those households determined to be in financial need of a subsidy. A means test would limit eli-

¹⁶In our final report that will be issued later this year, we will also present scenarios under which more than one television set per household is subsidized.

gibility for the subsidy to only those households with incomes lower than some specified limit. We employed two different levels of means tests. The scenarios with means tests are roughly based on 200 percent and 300 percent of the poverty level¹⁷ as the income threshold under which a household's income must lie to be eligible for the subsidy. The poverty level is determined based on both income and the number of persons living in the household; for a family of four the official federal poverty level in 2004 was \$18,850.

Set-top boxes. We provide estimates based on two possible price levels for the boxes: \$50 and \$100. This range is based on conversations we had with consumer electronics manufacturers who will likely produce set-top boxes in the future. Set-top boxes for cable and DBS are often rented by subscribers, rather than purchased. Nevertheless, in cases where cable and DBS subscribers need new equipment, we assume that the financial support provided to them would be equivalent to that provided to over-the-air households.

Table 1 provides the cost of a subsidy program under the assumption that cable and DBS providers downconvert broadcasters' signals at their facilities in a manner that enables them to continue to transmit those signals to subscribers as they currently transmit broadcasters' signals. In this case, cable or DBS subscribers do not require any new equipment, so only over-the-air households—approximately 21 million American households—would need new equipment. As shown in table 1, there is considerable variation in the cost of the subsidy program depending on the level of a means test and the price of the set-top box.

Table 1: Estimated Cost of Set-Top Box Subsidy, Assuming Cable and DBS Downconversion, only Over-the-Air Households Are Subsidized

Assumption about means test	Percent of over-the-air households eligible	Number of households subsidized (in millions)	Cost of subsidy, by estimated cost of set-top box (dollars in millions)	
			\$50 set-top box	\$100 set-top box
Means test at 200% of poverty level.	50% of over-the-air households.	9.3 (7.8-10.7)	\$463 (\$391-\$534)	\$925 (\$782-\$1,068)
Means test at 300% of poverty level.	67% of over-the-air households.	12.5 (10.9-14.1)	\$626 (\$545-\$707)	\$1,252 (\$1,090-\$1,415)
No means test	All over-the-air households	20.8 (19.1-22.6)	\$1,042 (\$954-\$1,130)	\$2,083 (\$1,907-\$2,259)

Source: GAO.

Notes: Ninety-five percent confidence intervals in parentheses. Analysis based on the status of television households in 2004.

Table 2 provides the cost of a subsidy program under the assumption that cable and DBS providers are required to transmit broadcasters' digital signals in the same format as they are received. Under this scenario, nearly all over-the-air households and most cable and DBS subscribers will not have the equipment in place to view high-definition digital broadcast signals. Although subscribers typically rent, rather than purchase, set-top boxes, we assume that the same level of subsidy is provided to these households as is provided to over-the-air households to defray the cost of having to obtain a new or upgraded set-top box from their provider.

Table 2: Estimated Cost of Set-Top Box Subsidy, No Cable or DBS Downconversion, Subsidy Provided to Over-the-Air and Cable and DBS Households

Assumption about means test	Percent of U.S. households eligible	Number of households subsidized (in millions)	Cost of subsidy, by estimated cost of set-top box (dollars in millions)	
			\$50 set-top box	\$100 set-top box
Means test at 200% of poverty level.	31% of households	35.1 (32.7-37.5)	\$1,753 (\$1,633-\$1,873)	\$3,506 (\$3,266-\$3,745)
Means test at 300% of poverty level.	50% of households	55.5 (52.9-58.1)	\$2,775 (\$2,646-\$2,904)	\$5,551 (\$5,293-\$5,809)
No means test	Nearly all households	106.2 (105.1-107.3)	\$5,312 (\$5,257-\$5,367)	\$10,624 (\$10,514-\$10,734)

Source: GAO.

Notes: Ninety-five percent confidence intervals in parentheses.

¹⁷ See appendix I for a methodological discussion and assumptions surrounding our determination of thresholds used to approximate the poverty level.

Analysis based on the status of television households in 2004.

There are two issues that stand as important caveats to the analyses we have presented on estimated set-top box subsidy costs. The first is that we based the majority of the analyses on survey results that provide information on the status of American television households as of early 2004. Over the next several years, new households will be established, some households might change the means through which they watch television, televisions sets with integrated digital over-the-air tuners as well as digital cable compatibility will be purchased, and some cable and DBS households will have obtained set-top boxes capable of receiving high-definition digital signals from their providers. Households' purchase of certain new equipment could obviate the need for a subsidy for new television equipment. For example, some households may purchase a digital television set with an over-the-air tuner and begin to view digital broadcast signals in this manner; some large televisions sold today are required to include such a tuner and by July 2007, all television sets larger than 13 inches are required to include a tuner. In time, these factors could have the effect of reducing the cost of a set-top box subsidy because fewer households would need to be subsidized.¹⁸

The second caveat to these analyses is that these subsidy estimates do not include any costs associated with *implementing* a subsidy program. If the federal government determines that it would be worthwhile to provide this subsidy, the subsidy would need to be administered in some fashion, such as through a voucher system, a tax credit, a mail-in rebate, government distribution of equipment, or some other means. Any of these methods would impose costs that could be significant for the federal government and any other entities involved in administering the program. Such costs would be difficult to estimate until a host of decisions are made about how a subsidy program would be administered.

As I mentioned earlier, our work on the DTV transition continues, and we will provide more information in a report later this year. We will discuss various ways that a subsidy program might be administered and provide some analysis of the benefits and drawbacks of these various methods. We will also provide a discussion of how information regarding the DTV transition and any associated subsidy program might best be provided to the American people.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions you or other Members of the Committee may have at this time.

APPENDIX I: METHODOLOGY FOR USE OF SURVEY DATA REGARDING TELEVISION VIEWING

To obtain information on the types of television service and equipment used by U.S. households, we purchased existing survey data from Knowledge Networks Statistical Research. Their survey was completed with 2,375 of the estimated 5,075 eligible sampled individuals for a response rate of 47 percent; partial interviews were conducted with an additional 96 people, for a total of 2,471 individuals completing some of the survey questions. The survey was conducted between February 23 and April 25, 2004.

The study procedures yielded a sample of members of telephone households in the continental United States using a national random-digit dialing method. Survey Sampling Inc. (SSI) provided the sample of telephone numbers, which included both listed and unlisted numbers and excluded blocks of telephone numbers determined to be nonworking or business-only. At least five calls were made to each telephone number in the sample to attempt to interview a responsible person in the household. Special attempts were made to contact refusals and convert them into interviews; refusals were sent a letter explaining the purpose of the study and an incentive. Data were obtained from telephone households and are weighted by the number of household telephone numbers.

As with all sample surveys, this survey is subject to both sampling and nonsampling errors. The effect of sampling errors due to the selection of a sample from a larger population can be expressed as a confidence interval based on statistical theory. The effects of nonsampling errors, such as nonresponse and errors in measurement, may be of greater or lesser significance but cannot be quantified on the basis of available data.

Sampling errors arise because of the use of a sample of individuals to draw conclusions about a much larger population. The study's sample of telephone numbers

¹⁸As we mentioned above, if at a later date the Congress considers legislation for a set-top box subsidy program, the CBO will, based on the specifics of the law, prepare an estimate of the cost of the program.

is based on a probability selection procedure. As a result, the sample was only one of a large number of samples that might have been drawn from the total telephone exchanges from throughout the country. If a different sample had been taken, the results might have been different. To recognize the possibility that other samples might have yielded other results, we express our confidence in the precision of our particular sample's results as a 95 percent confidence interval. We are 95 percent confident that when only sampling errors are considered each of the confidence intervals in this report will include the true values in the study population. All percentage estimates from the survey have margins of error of plus or minus 6 percentage points or less, unless otherwise noted.

In addition to the reported sampling errors, the practical difficulties of conducting any survey introduce other types of errors, commonly referred to as nonsampling errors. For example, questions may be misinterpreted, some types of people may be more likely to be excluded from the study, errors could be made in recording the questionnaire responses into the computer-assisted telephone interview software, and the respondents' answers may differ from those who did not respond. Knowledge Networks has been fielding versions of this survey for over 20 years. In addition, to reduce measurement error, Knowledge Networks employs interviewer training, supervision, and monitoring, as well as computer-assisted interviewing to reduce error in following skip patterns.

For this survey, the 47 percent response rate is a potential source of nonsampling error; we do not know if the respondents' answers are different from the 53 percent who did not respond. Knowledge Networks took steps to maximize the response rate—the questionnaire was carefully designed and tested through deployments over many years, at least five telephone calls were made at varied time periods to try to contact each telephone number, the interview period extended over about 8 weeks, and attempts were made to contact refusals and convert them into interviews.

Because we did not have information on those contacted who chose not to participate in the survey, we could not estimate the impact of the nonresponse on our results. Our findings will be biased to the extent that the people at the 53 percent of the telephone numbers that did not yield an interview have different experiences with television service or equipment than did the 47 percent of our sample who responded. However, distributions of selected household characteristics (including presence of children, race, and household income) for the sample and the U.S. Census estimate of households show a similar pattern.

To assess the reliability of these survey data, we reviewed documentation of survey procedures provided by Knowledge Networks, interviewed knowledgeable officials about the survey process and resulting data, and performed electronic testing of the data elements used in the report. We determined that the data were sufficiently reliable for the purposes of this report.

Due to limitations in the data collected, we made several assumptions in the analysis. Number of televisions and number of people in the household were reported up to five; households exceeding four for either variable were all included in the category of five or more. For the purposes of our analyses, we assumed that households had no more than five televisions that would need to be transitioned and no more than five people. Number of people in the household was only used in calculating poverty, but may result in an underestimate of those households in poverty.

Calculations of poverty were based on the 2004 Poverty Guidelines for the 48 contiguous states and the District of Columbia, published by the Department of Health and Human Services. We determined whether or not each responding household would be considered poor at roughly 200 percent and 300 percent of the poverty guidelines. Income data were reported in categories so the determination of whether or not a household met the 200 percent or 300 percent threshold required approximation, and for some cases this approximation may have resulted in an overestimate of the number of poor households. In addition, income data were missing for 24 percent of the respondents. To conduct the analyses involving poverty, we assumed that the distribution of those in varying poverty status was the same for those reporting and not reporting income data. Comparisons of those reporting and not reporting income data show some possible differences on variables examined for this report; however, the income distribution is very close to the 2003 income estimates published by the U.S. Census Bureau.

To determine total numbers of U.S. households affected by the transition and total cost estimates for various transition scenarios, we used the U.S. Census Bureau's Current Population Survey estimate of the total number of households in the United States as of March 2004. To derive the total number of households covered by the various scenarios, we multiplied this estimate by the proportions of households covered by the scenarios derived from the survey data. The standard error for the total

number of U.S. households was provided by the Census Bureau, and the standard errors of the total number of households covered by the scenarios take into account the variances of both the proportions from the survey data and the total household estimate. All cost estimates based on the survey data have margins of error of plus or minus 16 percent or less.

In addition, we contracted with Knowledge Networks to recontact a sample of their original 2004 survey respondents in October 2004. Households were randomly selected from each of three groups: broadcast-only television reception, cable television service without a set-top box, and satellite television service. For each group, 102 interviews were completed, yielding 306 total respondents (for a 63 percent response rate). To reduce measurement error, the survey was pretested with nine respondents, and Knowledge Networks employed interviewer training, supervision, and monitoring, as well as computer-assisted interviewing, to reduce error in following skip patterns. Due to the small sample size, the findings of these questions are not generalizable to a larger population.

Mr. UPTON. Thank you.
Dr. Kim.

STATEMENT OF JONG KIM

Mr. KIM. Thank you, Mr. Chairman and members of the subcommittee.

My name is Jong Kim. I am Vice President of Research for LG Electronics, a \$30 billion global consumer electronics company. I also serve as Senior Vice President of LG's Zenith Electronics subsidiary in Chicago, Illinois where I have been working on digital television for the past 15 years.

This committee has requested that LG comment on the pricing and the timetable for deployment of these converter boxes. Among the factors to consider are technology, sales volume, and license fees. Please allow me to address each of these topics briefly.

First, technology. We expect to produce converter boxes that will receive all 18 formats of the ATSC DTV standard and it will output only a standard definition analog signals similar to DVD players and VCRs that connect to today's analog TVs. This will allow the consumer with a current analog TV to enjoy the best possible pictures as well as to take advantage of the extra channels available through digital multi-cast terrestrial DTV broadcasts.

The level of technology in this converter box is very similar to that in our \$40 to \$60 DVD players with the DVD's disk player mechanism replaced by a low-cost DTV tuner. This similarity suggests comparable pricing between these two devices.

Second, sales volume. The price of DVD players dropped from more than \$500 to less than \$100 within 5 years, due almost entirely to the growth in sales volume. At the least, 70 million analog TVs in the U.S. today rely upon over-the-air service. While many consumers already replaced these analog TVs with new integrated DTV sets, many others will wish to continue to use their analog sets, providing a viable market for low-cost converter boxes. In addition, the FCC's DTV tuner regulations will drive down cost of the ATSC chip sets. A digital tuner 3 years from now should cost about the same as an analog tuner today.

Third, and final consideration in the set-top box pricing equation relates to the licensing fees for patents held by the companies that invested in bringing set-top box technologies to market. For comparison, even the lowest-priced, bargain basement DVD player today has royalties in the range of \$10 to \$15. This is comparable to the royalty range for a basic digital-to-analog converter box.

Based upon LG's experience with DTV set-top boxes, we estimate that the retail price of a simple digital-to-analog converter box will be under \$100 by 2006 based upon volumes in the millions of units. And it should reach the \$50 to \$70 range by 2008, assuming sales volumes in the tens of millions of units. Of course, as more units are required, the price will be lower, and could be lower even earlier than these dates.

These low-cost set-top boxes will provide an option for consumers who will be satisfied with the standard definition. At the same time, consumers who want the high-definition reception and other features will pay more, just as they do today for progressive scan DVD players.

There are other factors that will help to advance the transition to DTV. These include new products, additional compelling digital content, consumer education efforts, and the final resolution of digital cable carriage and digital copyright concerns. We look forward to continuing to work with you to ensure that all Americans are able to enjoy the benefits of digital TV.

I am, of course, pleased to respond to any questions that you may have, and I appreciate the opportunity to appear before you today. Thank you.

[The prepared statement of Jong Kim follows:]

PREPARED STATEMENT OF JONG KIM, LG ELECTRONICS, INC.

Mr. Chairman and members of the Subcommittee, my name is Jong Kim and I welcome the opportunity to appear before you today. I am Vice President of Research for LG Electronics Inc. (LG), a \$30 billion global leader in consumer electronics, information technology and communications products. I also serve as Senior Vice President for LG's Zenith subsidiary, where I have been working on digital television (DTV) technologies for the past 13 years.

As a long-time participant in digital television, I am pleased to appear before you today on behalf of LG Electronics U.S.A., Inc., which is the North American subsidiary of LG. A leading supplier of digital high-definition television (HDTV) integrated receivers, set-top boxes (STBs) and displays, LG already is developing its sixth-generation DTV reception chipset. LG is the parent company of Zenith Electronics Corporation, a long-time leader in consumer electronics generally and digital HDTV specifically. Zenith is the inventor of the digital modulation technology at the heart of the DTV Standard adopted by the Federal Communications Commission (FCC) and has been a wholly owned subsidiary of LG Electronics since 1999.

The Committee is focused today on the specific issue of the relationship of converter boxes to the digital transition. Mr. Chairman, LG shares your view that this transition is of critical importance. This Committee has been instrumental in advancing DTV's deployment, and we are seeing exciting marketplace developments involving digital technologies. Digital transmission offers incredible high-resolution video, and anyone who has experienced HDTV becomes a believer in this technology. In addition to these benefits, the digital transition provides an opportunity to return spectrum for important governmental objectives (including public safety and homeland security needs) and to deploy new commercial technologies for consumers. There are many issues associated with the transition, including potential government subsidies to help consumers purchase boxes capable of converting free, over-the-air DTV broadcast signals for viewing on their existing analog TV sets. These are exciting times for all involved in digital technologies.

LG has been asked to comment today on the pricing and timetable for deployment of converter boxes. Several factors influence any estimate of converter box costs, including the level of technology, unit sales volume, and licensing fees. Please permit me to address each of these topics briefly.

The level of technology necessary for a basic digital-to-analog converter box is much less than is required for today's more full-featured STBs that output high-definition signals and retail for \$200 to \$400. We contemplate the manufacture of converter boxes that will receive and demodulate all 18 formats of the ATSC DTV Standard, but will output only low-resolution analog signals via a simple radio frequency (RF) connector—like DVD players and VCRs connect to analog TVs today.

This is sufficient for the average consumer to enjoy the DTV experience. In fact, consumers who have been watching snowy analog TV pictures will love the crisp, studio-quality digital pictures even on their older, low-definition televisions sets using one of these simple digital-to-analog converters. While analog TVs will not display full high-definition resolution, these boxes will allow consumers to take advantage of the increased number of channels available through digital multicast terrestrial DTV broadcasts.

With regard to the price of converter boxes, we think it is useful to compare the technology of DVD players to the technology of these simple digital-to-analog converter boxes. Even today's most affordable DVD players (in the \$40-\$60 range) contain a disc-handling mechanism, along with a microprocessor, memory, MPEG decoding chipset, as well as the standard power supply, enclosure hardware and remote control. A digital-to-analog converter box will have essentially the same components, with a low-cost DTV tuner replacing the disc-playing mechanism; this similarity suggests comparable pricing between these two devices.

In considering the impact of unit sales volume relative to digital-to-analog converter box prices, the DVD example is instructive again. Prices for DVD players plummeted within five years from more than \$500 to less than \$100, based almost solely on their explosive sales growth. As you know, the FCC has adopted DTV tuner regulations requiring the phased-in inclusion of DTV tuners in all television receivers 13-inches and larger by mid-2007. This requirement is expected to have an effect similar to the DVD experience, exponentially driving down the costs of ATSC chipsets. As a result, a digital tuner three years from now should cost about the same as an analog TV tuner today.

In addition, LG believes that we can achieve the economies of scale required to ensure that a very low-cost converter box is available. Estimates point to 70 million-plus analog television receivers in the United States today that rely upon over-the-air service (i.e., are not connected to a cable or satellite provider). We expect that, while many consumers will replace these analog TVs with new, integrated DTV sets, many others will continue to use their analog sets, thereby providing a viable market to drive the production of a very large volume of low-cost converter boxes. Another consideration in the overall STB pricing equation relates to licensing fees for patents held by the companies that invested in bringing STB technologies to market. Even the lowest-priced, bargain-basement DVD player has royalties in the \$10-\$15 range. This is essentially comparable to the royalty range for any basic digital-to-analog converter box.

Based on our DTV experience and expertise in the design and manufacture of DTV set-top boxes, LG estimates that the retail price of a simple digital-to-analog converter box such as I have described will be under \$100 by 2006, accounting for technology levels and licensing fees, and assuming production volumes in the millions of units. These three key factors affecting future STB pricing—(technology level, unit sales volume and licensing fees) suggest to us that that digital-to-analog TV converter prices may be as low as \$50 by 2008, assuming industry-wide demand of tens of millions of units by then.

Of course, by 2008 there will be a range of options, including very affordable integrated DTV receivers. Those who want high definition reception and other features will pay more, just as they do today for progressive-scan DVD players. For consumers who want a very low-cost standard definition solution, a target retail price of \$50-\$70 should be attainable in a little over three years from now, assuming annual sales volume in the tens of millions of units.

There are other factors, of course, that affect the digital transition. Manufacturers such as LG Electronics are doing our part to offer consumers a wide array of quality DTV products at affordable prices. Product prices will continue to decline, as they have done since DTV's introduction in 1998, and this will speed the transition. Other remaining issues that must be addressed to bring the DTV transition to completion include the provision of additional compelling digital content, consumer education efforts, and final resolution of digital cable carriage and digital copyright concerns. Progress has been made on the issue of compatibility between cable equipment and consumer electronics products as a result of cooperative effort by these industries, and work continues on two-way compatibility.

LG Electronics commends this Committee for having the foresight now to examine the end of the transition and to consider a framework for minimizing the potential disruption to consumers when the final switch-over to digital broadcasting occurs. We look forward to continuing to work with you to ensure that all Americans are able to enjoy the tremendous benefits of digital television.

I am, of course, pleased to respond to any questions you may have, and I appreciate the opportunity to appear before you today.

Mr. UPTON. Thank you.
Mr. Yager, welcome.

STATEMENT OF K. JAMES YAGER

Mr. YAGER. Thank you, Mr. Chairman, and members of the subcommittee—

Mr. UPTON. You need to get that—you just need to punch the button on that mike.

Mr. YAGER. Right here? Did I get it?

Thank you.

I had my good friend from the electronics industry to help me out there.

My name is Jim Yager. I am Chief Executive Officer of Barrington Broadcasting, which owns and operates three television stations in Michigan and Illinois. I serve on the board of directors of the National Association of Broadcasters and the Association for Maximum Service Television.

Today, I would like to discuss the status of the DTV transition, the necessity of protecting viewers that rely on-over-the air television, the importance of ensuring that cable subscribers are not deprived of the benefits of DTV, and most importantly, the need to insulate consumers from any harm during the digital transition.

Broadcasters are proud of our DTV accomplishments. Today, according to FCC, 1,488 local television stations are on the air in digital in markets that serve over 99 percent of U.S. TV households. DTV content has arrived as well, with over 2,500 hours of broadcast HDTV programming a year. After spending billions of dollars, broadcasters have done their part to make DTV a reality. We recognize the need to bring this transition to a conclusion and ultimately to end analog broadcasts. In fact, our stations have strong economic incentives to do so.

None of us enjoys paying double in operating costs to power both our analog and digital transmitters. However, it is premature to discuss the end of the transition without first resolving the number of policy impediments that could block consumers from reaping the full benefits of digital television. Chief among the remaining stumbling blocks are questions surrounding what broadcast DTV service cable companies will permit their subscribers to view. Cable operators have known for years of the impending DTV transition, but now are seeking to convert digital, high-definition signals to analog formats at the head end of their systems.

Down-conversion at the head end would mean that consumers who invest in HDTV sets would then find themselves receiving an identical picture as their neighbor's analog-only TVs. Imagine if, during the 1960's, consumers purchased color sets, brought them home, and plugged them into their cable box only to see black-and-white pictures. That is what cable today is proposing with conversion at the head end. And the question must be asked, if the end result is turning digital signals back into analog, why did we undertake this transition to begin with.

Perhaps the most critical policy question now is how to protect consumers during the shift to digital. A few simple facts highlight exactly why this is imperative.

The GAO reports nearly 21 million U.S. households rely exclusively on over-the-air television reception for their TV. These households are among our most economically vulnerable, such as low-income senior citizens. For instance, ½ of households with the head of the family who is over 50 and the annual income is less than \$30,000 are broadcast-only households. As GAO stated, minorities are also disproportionately affected. Twenty-eight percent of Hispanic households rely solely on over-the-air television. And according to Knowledge Networks, African American households are 22 percent more likely to rely on over-the-air signals. If a hard cutoff date for the end of analog were imposed tomorrow, these households would lose their ability to receive any television whatsoever.

The problem of a hard date does not end with the 20 million over-the-air homes. Including second and third sets and satellite and cable homes, there are 73 million television sets in this country that rely solely on over-the-air signals. A premature hard date sends these 73 million television sets to the local landfill. It is unconscionable to me that every year another 30 million analog-only sets are sold to unsuspecting consumers without any warning that the product may soon be obsolete. Under the current tuner phase-in schedule, analog-only sets will continue to be sold until July 2007.

As Congress seeks solutions for migrating these analog-only viewers into the digital world in an orderly fashion, a series of questions must be answered. As there are currently no digital-to-analog converter boxes on the market today, will any manufacturer step up and offer a low-cost converter box? How quickly can manufacturers produce enough converter boxes for consumers? Will government reimburse households for converter boxes? Who will be eligible for reimbursement? Will households be reimbursed for converting multiple sets in the same home or only for a primary set? Will reimbursement cover just converter boxes or the cost of an antenna? And how much will this whole process cost?

I am sure that before legislating such an ambitious program, the committee will hold extensive hearings to probe these issues. Broadcasters want to be part of that dialog.

In closing, let me re-emphasize. The transition system for DTV has been built. The programming is here. Now the challenge for Congress is two-fold: first, ensuring that both over-the-air viewers and cable subscribers enjoy the full benefits of digital television while, second, protecting over-the-air viewers from losing local television altogether.

Thank you.

[The prepared statement of K. James Yager follows:]

PREPARED STATEMENT OF K. JAMES YAGER, CEO, BARRINGTON BROADCASTING COMPANY ON BEHALF OF THE NATIONAL ASSOCIATION OF BROADCASTERS AND MSTV

Good morning Mr. Chairman. I am K. James Yager, CEO of Barrington Broadcasting Company. I appear today on behalf of the National Association of Broadcasters to discuss important issues related to our transition to digital television (DTV). I will emphasize the critical need to focus on consumers during this transition to ensure that all Americans will continue to have access to the best free over-the-air television service in the world. As I will explain below, there are valuable lessons we can learn from the DTV conversion experience in Berlin, Germany. I will also note, however, that the German experience is not fully translatable to ours here

in America because the potential for consumer disenfranchisement we face in this country is much greater than that faced in Berlin.

As an initial matter, let me say that broadcasters have and will continue to fully support the digital television transition. We recognize that consumers will reap dramatic benefits from the amazing digital television technology. The transition period gives consumers an opportunity to trade out their analog receivers for digital ones on their own timetable. But, the transition cannot go on forever. Thus, Congress settled on the point when 85 percent of U.S. households is digital-capable for the turn-off of analog broadcasting.

It remains important to focus on the remaining 15 percent of households that will need to be accommodated in some way. As the 85 percent test is met in market after market, analog television sets without converters will go dark. Consumers in 20.5 million households that rely solely on over-the-air (“OTA”) broadcast television will lose all television service if they have not procured digital television-capable receivers or converters. This situation has the sure signs of significant disruption, and the Subcommittee is wise to begin to plan for that time, in order to minimize disruption.

NAB believes that protecting consumer’s access to their favorite television programming and channels, as well as to news, information and emergency alerts, will be critical to a successful conclusion to our digital television transition. Thus, we would like to discuss in this testimony what we see as necessary to preserve consumers’ access to television, most particularly over-the-air only consumers who could be completely cut off from television by a hard cut-off date. And we must not forget that there are millions of unwired television sets in cable and satellite homes as well. Approximately 18.3 million MVPD households have one or more television sets that rely solely on over-the-air television reception. There are today approximately 280.5 million analog sets in use.¹ Consumers may not readily dispose of these sets, even if they have purchased a new digital television receiver.

The FCC has set in motion measures that will foster the DTV transition by providing incentives for consumers to buy DTVs. At some point, however, Congress must take the steps necessary to protect OTA sets from obsolescence. Clearly, the free, universal OTA broadcast service must be preserved and the 20.5 million households that rely on it must be protected against loss of television service.

Many OTA households will likely have purchased DTV-capable receivers by the time analog broadcasting ends. But for the remaining OTA households (and for analog sets in all households), there must be a solution, or rather, a series of solutions. One answer is the subsidization of digital-to-analog converters for “non-digital” OTA households. Another measure is promotion and education about DTV, to encourage consumers to purchase DTVs. A near term measure that could be adopted would be to require warning labels on analog-only sets, alerting consumers to the limited useful life of these sets.

The real key to ending the transition, to not disenfranchising large numbers of consumers and to mitigating the disruption for consumers with analog sets, will be making digital-to-analog converters widely available at a reasonable price. Some government subsidization likely may be necessary here. The FCC’s practice of requiring auction winners to bear the costs of moving incumbent spectrum users would seem to be a useful idea, particularly as broadcasters have shouldered DTV transmission costs.

Before we return to our comments on the numbers of consumers and sets to be dealt with at the end of the transition and our thoughts about digital-to-analog converters, we would like to take a moment to discuss the Berlin transition to digital. We agree with the Subcommittee that it is important to examine both the Berlin and the greater German experience and the distinctions between that situation and ours in the United States. We look forward to hearing and reviewing the testimony presented today by GAO on the greater German experience, but we would like to review some of what NAB told this Committee last year about Berlin’s transition and ours.

Germany, and particularly Berlin—the first place in the world where digital television broadcasting has completely supplanted analog—offers some instructive comparisons to the DTV transition in the United States. Nonetheless, there are striking differences between the German experience and ours which amply demonstrate why

¹NAB appends hereto, as Attachment A, a series of charts constructed for the FCC’s proceeding inquiring about options for minimizing the disruption to consumers when the switch-over to digital broadcasting occurs. See *Public Notice*, MB Docket No. 04-210, DA 04-1497, May 27, 2004. In that proceeding, the FCC asked for quantitative data on viewers and receivers. See also Comments and Reply Comments of the National Association of Broadcasters and the Association for Maximum Service Television, Inc. in that docket. The estimates used in this testimony are from Attachment A.

accelerating the digital transition here will require significantly more consumer-friendly actions by the government.

Let's look at some of the ways German digital television differs from our DTV transition. The single biggest difference is that Berlin—like other European DTV plans—does not include any provision for High Definition Television. DTV in the United States began in response to HDTV, a new Japanese technology that promised much greater picture and sound quality. Although the U.S. digital television system will also permit multicasting and the distribution of new data services, it has always included HDTV capability, and the amount of HDTV programming available here is great and continues to expand. In the United States, HD has been the only incentive for consumers to purchase digital receivers, particularly since most cable systems have refused to pass through any other DTV services. While the FCC recently voted to deny cable carriage of broadcasters' multicast programming, NAB believes that decision bears re-evaluation by this Subcommittee. We believe that multicasting as an option for some programming and some dayparts will be critical to preserving the vitality of the free over-the-air broadcast system. Multicasting is also a powerful additional incentive for consumers (particularly OTA-only consumers) to purchase digital sets or converters. But multicasting will only be developed if there is access to the entire audience for such offerings, not just access to OTA-only sets.

By contrast, European DTV was intended primarily to offer more programming choices. European analog television for the most part has offered fewer television signals to consumers than are available in the United States and a higher percentage of noncommercial services (for which viewers pay a receiver tax).²

This profound difference has several consequences. First, European consumers who move to DTV reception receive an immediate benefit of more channels at no additional cost. In Berlin, buying a digital TV or a set-top box increased viewer choice from eight channels to roughly 30 channels.³ Second, since there is no need to decode or display HDTV signals, the memory and processing requirements of DTV receivers and set-top boxes is much less in Europe than in the United States. Thus, it is relatively cheaper to manufacture digital receivers for European DTV. DTV receivers were available in Berlin, for example, for around 200 euros, far less than HDTV-capable receivers cost here,⁴ and set-top boxes there were also less expensive.⁵

Moreover, because digital transmissions in Germany are not high definition, a consumer with an analog receiver who acquires a digital set-top box would receive the same programs at almost the same quality as a consumer with a new digital receiver. Similarly, if a cable system in Berlin converts a broadcast digital signal to analog for display on analog receivers connected to the cable system, the cable subscriber receives essentially the same thing as he or she would if the cable system were delivering the digital signal in its native format to a digital receiver.

It is important to emphasize that down-conversion has a far more negative impact in the United States. If a U.S. cable system down-converts a broadcast DTV signal, as some have suggested, cable subscribers will *not* receive what they would get if they had a digital receiver and the cable system carried the broadcast digital signal. The consumer would not receive high definition pictures or better sound and would not receive multicast signals or data transmissions. There would be little reason for those consumers to purchase digital receivers and, of course, if they already had DTV sets, they would not get much of the benefit of their purchase. An apt analogy would be to imagine that consumers who purchased color television sets in the 1960s found when they brought the color sets home, they would still only see black and white pictures. The predictable public outcry against wasteful government requirements would likely be intense.

²In many countries, penetration of cable or satellite multi-channel video providers has been far less than in the United States and, even where MVPD penetration has been substantial (like Berlin), the number of channels provided has been fewer than typical American systems provide.

³The Berlin authorities thought it particularly significant that moving to DTV resulted in consumers "receiving more services for which the license fee is paid." DVB-TV: Das Überall Fernsehen, *Berlin Goes Digital* (accessed at <http://www.mabb.de/start.cfm?content=aktuelles&id=632>) at 15 (hereinafter *Berlin Goes Digital*). Berlin already had more operating channels than other parts of Germany where three to five analog channels are typical. Berlin was able to have these additional channels because of spectrum vacated by former East German stations after reunification. While some other German cities are expected to begin digital transmission this year, much of Germany under current plans will never have digital over-the-air television because sufficient channels are not available.

⁴*Id.* at 5.

⁵The current exchange rate is approximately \$1.30 to the euro. Set-top boxes have been on sale in Berlin for as little as 69 euros, or about \$89.00 (U.S.).

As a consequence of these differences, the digital conversion in Berlin presented consumers with a very different value proposition—for a fairly modest one-time expenditure, the consumers could get the equivalent of free basic cable for life. Moreover, nearly the full benefits of the conversion could be realized on TV sets, small and large, analog and digital alike. So it was not difficult to persuade consumers to buy the digital sets and boxes and there was little danger of consumer resentment over the premature obsolescence of their existing sets.⁶ In the long run, we believe that European consumers and broadcasters will come to regret foreclosing the benefits that HDTV will provide, particularly as other digital media increase their ability to deliver the highest quality sound and pictures.

Another distinction between the Berlin and American transitions are the obligations placed on cable. Cable in Berlin was required to carry all broadcast services and to protect analog-only households after the switch-over to digital. In stark contrast, the FCC just last week acted to deny cable carriage for all but one free stream of digital broadcast programming. And, there are still no obligations on cable systems to ensure that their analog-only subscribers will have access to local television signals after analog broadcasting ends.

This is a very important point. One of the reasons that analog broadcasting was able to be switched off in Berlin was the prevalence of cable and satellite delivery systems. Only about seven percent of Berlin households received television over the air, a lower percentage than in the rest of Germany.⁷ An even smaller number of homes in Berlin (about 90,000) relied on terrestrial transmission for second and third sets.⁸ In the United States, it is estimated that there are 45 million sets in homes that are not connected to any cable or satellite system and an additional 28 million unwired sets in cable or satellite households. In total, over 25 percent of all televisions (73 million receivers) rely solely on over-the-air transmission and will need to be replaced or have converters attached in order to operate after analog broadcasting ends.

Because so large a percentage of Berlin homes relied on cable or satellite to receive local television, and those systems were required to ensure that broadcast digital programming reached all of their subscribers, there was no risk that consumers would be stranded as is likely here. Further, there was very little risk that ending analog broadcasting would result in a significant loss of audience or revenue for commercial broadcasting. The result here is much different.

One of Congress' objectives when it authorized the transition to digital beginning in 1996 was to strengthen the over-the-air broadcasting system. A premature end to analog broadcasting before consumers are ready may have the opposite effect of reducing the audience of local stations and thus reducing their ability to provide attractive programming and local public service. If consumers are driven to cable and satellite programming, that would increase those monopoly providers' gatekeeper power and frustrate Congress' goal of improving local broadcasting.⁹

These differences are significant and make it apparent that Berlin does not provide a ready model for the United States. In particular, as we discuss here, the very much larger number of sets that rely on over-the-air transmissions, as well as the very large number of analog sets in cable and satellite homes for which no DTV transitional carriage rules have been established, make it impossible to conclude that a Berlin-style transition would not harm the public interest in a strong local broadcasting system.

Despite this, there are certainly lessons that we can take from the Berlin experience. The German authorities recognized that moving millions of consumers from analog to digital, while resulting in significant benefits for consumers, would create burdens that should not fall on broadcasters. Instead, they concluded that "[s]olving the issue of social acceptability of the switchover is a public duty to be fulfilled by the state."¹⁰ The response from consumers in Berlin also counters suggestions that it is not important to maintain the level of over-the-air services. "Numerous com-

⁶The license fee paid by all set owners is 16 euros per month, so the cost of a set-top box represented about four months of license fees.

⁷*Berlin Goes Digital* at 2. In Germany, satellite service is free to the consumer after the purchase of the receiver; cable service typically costs only 12-15 euros, much less than the cost of American cable service.

⁸*Id.* at 3.

⁹In this regard, it is worth noting that there are no plans to bring terrestrial digital service to much of rural Germany. It is not clear whether those areas will lose over-the-air service altogether or be left with analog service only. The American DTV transition is intended to ensure that high-quality digital television be available across the country.

¹⁰*Berlin Goes Digital* at 12.

ments by viewers...refute the claim that viewers traditionally receiving television through the air would be content with fewer services—the opposite is the case.”¹¹

Another important lesson is that free TV is crucial to any transition from analog to digital. The experience not only in Germany, but also in the United Kingdom and in Spain with pay digital television—where those services languished—shows that the “switchover must be undertaken with free-to-air television.”¹² Indeed, in England, the subscription terrestrial DTV service collapsed; digital penetration began to increase significantly only with the development of the Freeview system that greatly expanded consumer choice by providing multiple channels of free over-the-air programming.¹³

One other part of the Berlin experience is particularly instructive. The Berlin authorities concluded that one of the advantages that could be obtained from a transition to DTV was the increased potential for portable applications. This is achieved through a system of distributed transmission where additional transmitters repeat the signal and enable it to reach televisions without roof-top antennas. The same capability has been developed for the U.S. digital broadcast system, and broadcasters have asked the FCC to authorize its use. The FCC has agreed in principle. Final action by the FCC on this issue would also help advance the transition here.

Let me turn back for a moment to the critical issue of over-the-air viewership and the availability of digital converters. Without the widespread availability of low cost digital-to-analog down-converters, the FCC risks disenfranchising millions of viewers and rendering useless the analog sets they rely on and, in many cases, just recently bought. Not only is the OTA analog set population enormous (73 million) and the number of OTA-only homes huge (20.3 million households), the importance of OTA service cannot be overstated in terms of the OTA viewing public’s reliance on the free, over-the-air service for news and information and emergency alerts.

To evaluate the stake the public has in this transition (and to assess the damage that various proposals affecting the digital transition may inflict on the public), Congress must take into account three components of the public interest served by over-the-air television: The first component is the 18.9 percent of viewers that rely solely on over-the-air service, whether because they cannot afford to subscribe to cable or DBS, because cable or DBS service is not available to them or does not provide local broadcast signals, or because they believe in the universal availability of free, over-the-air broadcast service. The second component is the owners of the 28 million of television sets in MVPD homes that are OTA-only analog sets. The third component consists of all viewers, because all viewers rely on over-the-air service in times of weather, terrorist or other emergencies when cable or satellite service may not be available and because broadcast television service provides an effective competitive check on cable and DBS services in terms of price, service, and diversity.

Many of the 18.9 percent of U.S. households that receive television service solely over the air do so by choice, not because economics dictates it. For example, a survey conducted by the Consumer Electronics Association found that “[l]ess than 30 percent [of households that have chosen not to subscribe to cable or DBS] indicate that insufficient funds play a role in their decision not to subscribe.”¹⁴ Many Spanish-speaking viewers choose not to subscribe to cable or DBS because these services offer primarily English-language programming.¹⁵

But there are also a large number of viewers who cannot afford pay television. Twelve percent of American households fall below the poverty line.¹⁶ They should not be forced by government policy into paying subscriber fees that only escalate over time and that they can’t afford. They deserve as an option—the preferred and responsible option—a vibrant, over-the-air service that provides the benefits of new digital technologies.

Over-the-air viewers have important, well thought out and legitimate reasons for relying on over-the-air reception, e.g., they believe in the value of free, over-the-air television; they do not want to be locked into the ever-increasing costs of pay television service; they view primarily alternative-language programming; they have additional sets that are not hooked up to cable or satellite, among others. They feel well-served by the locally-oriented and public interest programming they receive

¹¹ *Id.* at 15.

¹² *Id.* at 3; see *id.* at 16.

¹³ See Office of Communications, *Driving digital switchover: a report to the Secretary of State* (April 5, 2004)(accessed at <http://www.ofcom.org.uk/research/dso-report/?a=87101>).

¹⁴ Comments of the Consumer Electronics Association, MB Docket No. 04-210, August 11, 2004 (“CEA”) at 4.

¹⁵ Comments of Entravision Holdings, LLC, MB Docket No. 04-210, August 11, 2004, at 2.

¹⁶ See *Census Bureau says 1.3 million more slipped into poverty last year; health care coverage also drops*, CNN Money (Aug. 26, 2004), available at <http://money.cnn.com/2004/08/26/news/economy/poverty-survey>.

over the air and do not see the need nor do they want to be pushed to ever more expensive pay television services. Because broadcast television is universally available and is the only service used by millions of Americans, Congress should ensure that these viewers are not shut out or marginalized, but continue to have the option to rely on over-the-air reception and still receive meaningful local broadcast service.

As mentioned above, a key to ending the transition without disenfranchising large numbers of consumers and to mitigating the disruption for consumers with analog sets will be making digital-to-analog converters widely available at a reasonable price. In this regard, it is important to keep in mind not only the cost of such converters, but that low cost converters for making digital signals available to analog sets will need to have defined minimum technical capabilities. At a minimum, digital converters should be capable of receiving all digital broadcast formats, both HD and SD, on any VHF or UHF broadcast channel, and provide connection to an existing analog TV receiver via a channel 3 (or 4) RF interface. Thus, in conjunction with any analog receiver, the digital converter box should be able to receive, render and display usable pictures and sound from high definition as well as standard definition broadcasts, but would not be required to render pictures and sound at more than standard definition quality.

In order not to disenfranchise current OTA-only television viewers, digital converter boxes should be designed so as to maximize the likelihood that they will work with digital broadcast signals in the same receiving configuration (same antenna, location, etc.) as used for current analog NTSC reception. Thus, the digital converters should be able to receive and display signals under the most challenging receiving conditions, including low signal level, severe multipath and adjacent channel interference conditions. While marginal NTSC pictures are often comprehensible and accepted by TV viewers, the digital “cliff effect” cleanly separates digital TV viewers into those with watchable pictures and those without pictures at all. Thus, because viewers with poor digital reception would be essentially eliminated as television viewers, allowing less than excellent RF receiver performance in digital converters may sacrifice much of the broadcast-only viewing audience when analog transmissions cease.

Current DTV converters are available from about \$200 and up, although none are presently available with SD-only outputs. Like all other electronic components, the manufacturing cost of a digital converter box is closely related to the manufacturing volume. NAB and MSTV previously studied the cost of adding DTV capability to television receivers as well as the likely cost of set top boxes.¹⁷ The Arthur D. Little study noted that by the year 2006 digital converter boxes could be expected to sell at retail for under \$200, with a manufacturing cost near \$100, composed mostly of the fixed recurring costs of manufacturing (a physical box with a TV tuner, power supply, cabinet, remote control, switches, knobs, jacks, etc.) and only slightly impacted by the cost of the integrated circuits required to receive and process digital broadcasts.

Motorola’s 2004 testimony before this Subcommittee¹⁸ that a digital converter box with a retail price of \$67 is possible in 2007 would indicate that further price reductions from large volume production are possible. Similarly, LG Electronics indicated in FCC filings last summer that the retail price of a simple digital-to-analog converter box could be under \$100 by late 2005, assuming production volumes in the millions of units and that they believe that digital-analog TV converter prices may be as low as \$50 by 2008, assuming industry-wide demand of tens of millions of units by then.¹⁹

What does this all really mean? It tells us that relying on cable or satellite services to drive the transition to digital—as some have argued—will ultimately fail. Free local broadcasting has always been the core of television service. It will be, it must be, a primary driver of the digital transition. With it, we will have a vibrant new television service. Without it, we will have simply more variations on the same pay services, as well as diminishing news, emergency services and other public interest activities for which our communities rely on local broadcasters.

Broadcasters share the desire to bring the DTV transition to a close. Unlike Germany, American commercial broadcasters have been required to shoulder an enormous financial burden to build and operate digital facilities. No broadcaster wants to continue paying for both analog and digital operations for any longer than necessary. Instead, we look forward to an all-digital future.

¹⁷“Assessment of the Impact of DTV on the Cost of Consumer Television Receivers,” Final Report to MSTV and NAB, Arthur D. Little, Inc., September 10, 2001.

¹⁸“Motorola Broadband CTO to Speak Before House Subcommittee on Telecommunications Regarding DTV Transition,” Motorola press release, July 21, 2004.

¹⁹Comments of LG Electronics filed in FCC MB Docket, 04-210, August 11, 2004 at 3.

There is no question the DTV transition is progressing. Over 1370 television broadcasters are now on the air and reaching 99% of households in their communities and across the country with digital signals. What remains is a harder problem to solve and that is consumer adoption.

The FCC has taken significant steps to advance the transition, including the digital tuner mandate, the "Powell plan" and the agreement on cable compatibility standards. It is to be commended for its constructive approach. These steps are bearing fruit, not only in the availability of more and more exciting programming, but also in increased sales of digital receivers and displays. But, more is needed, particularly the now-denied digital carriage rules for the transition and afterwards. The FCC has failed to do what is needed to make this transition smoother. It is now up to Congress to correct that failure so that we can bring the transition to an end in this decade without causing significant disruption to consumers or reducing service.

Attachment A

**Estimates Related to Broadcast-Only TV Households and Sets,
and DTV Households with Over-the-Air Digital Broadcast Reception
Capabilities**

David Gunzerath, Ph.D.
Vice President, Research and Information Group
National Association of Broadcasters
August 11, 2004

Overview

The information on the following pages is responsive to questions that were asked in the Public Notice issued on May 27, 2004 by the FCC Media Bureau seeking quantitative data on over-the-air broadcast television users.

The information herein represents a compilation and analysis of data that was collected in the Spring 2004 wave of the Knowledge Networks/SRI *Home Technology Monitor* survey. The National Association of Broadcasters, as a subscriber to this survey, requested that a series of questions be included in this survey on the specific subjects of Broadcast-Only TV Households, Digital Television Set Ownership, and Over-the-Air Digital Television Reception Capability, among other topics. Data on these technologies that was collected from this survey were applied to Nielsen Media Research's 2003-04 U.S. Television Household estimates to calculate some of the figures contained in this report.

Question 1

The number of households that rely solely on over-the-air broadcasting ("over-the-air households") for their television service.

Broadcast-Only TV Households

Total U.S. TV Households	108,410,160 ^a
% of U.S. TV Households that are Broadcast-only	<u>18.9%</u> ^b

1. Broadcast-Only TVHs	20,489,520
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a) Source: Nielsen Media Research, *U.S. Television Household Estimates, 2003-04*
b) Source: Knowledge Networks/SRI *Home Technology Monitor Survey, Spring 2004*

Question 2

The number of households that subscribe to an MVPD and have one or more television sets that rely on OTA broadcast service.

MVPD Homes with One or More Broadcast-Only Set

Total U.S. TV Households	108,410,160 ^a
% of U.S. TV Households that subscribe to an MVPD service	<u>81.1%</u> ^b
Total MVPD HHS	87,920,640
% of MVPD HHS with one or more OTA-only sets	<u>20.8%</u> ^b
2. Total MVPD HHS with one or more OTA-only sets	18,287,493

a) Source: Nielsen Media Research, *U.S. Television Household Estimates*, 2003-04.

b) Source: Knowledge Networks/SRI *Home Technology Monitor Survey*, Spring 2004.

The number of analog-only television sets in use by the households identified in Questions 1 and 2; and the number of DTV sets capable of OTA reception in these HHs.

Total U.S. Television Sets

Broadcast-Only TVHHs	20,489,520
Mean no. of sets per Broadcast-only TVHH	2.20 ^b
Est. Total Sets in Broadcast-only Homes	45,076,944
MVPD TVHHs	87,920,640
Mean no. of sets per MVPD TVHH	2.75 ^b
Est. Total Sets in MVPD Homes	241,781,760
Est. Total Sets in All Homes	286,858,704

Digital Television/OTA Digital Set Penetration

Total U.S. TV Households	108,410,160 ^a
% of U.S. TVHHs with Digital TV Set	5.9% ^b
Est. Total U.S. DTV Sets *	6,396,199
% of DTV HHs with Digital OTA reception capability	22.9% ^b
Est. Total U.S. DTV Sets capable of OTA reception *	1,464,730
% of OTA capable DTV HHs that are Broadcast-only HHs	12.1% ^b
Est. OTA capable DTV sets in Broadcast-only HHs *	177,232
% of OTA capable DTV HHs that have MVPD service	87.9% ^b
Est. OTA capable DTV sets in MVPD HHs *	1,287,498
% of MVPD OTA capable DTV HHs with one or more Broadcast-only sets in the home	29.3% ^b
Est. OTA capable DTV sets in MVPD HHs with one or more Broadcast-only sets in the home *	377,237
4. Est. Total OTA capable DTV sets in HHs that are either Broadcast-only or are MVPD subs with one or more Broadcast-only sets in the home *	554,469

* Assumes one DTV set per DTV HH, an assumption consistent with the view that repeat purchasing in the early lifecycle stages of new consumer electronics is minimal. See eBrain Consumer Research, 2004 HDTV Research: Exploring Advertising Effectiveness, Debunking Consumer Confusion, p. 7.

a) Source: Nielsen Media Research, U.S. Television Household Estimates, 2003-04
 b) Source: Knowledge Networks/SRI Home Technology Monitor Survey, Spring 2004.

Questions 3-4

<u>Analog Sets in HHs with at Least One Broadcast-Only TV</u>	
Est. Total Sets in Broadcast-only Homes	45,076,944
Est. Total U.S. DTV Sets *	6,396,199
% of DTV sets (OTA capable or not) in Broadcast-only HHs	4.9% ^b
Est. No. of DTV Sets in Broadcast-only Homes *	313,414
Est. No. of Analog-only Sets in Broadcast-only Homes *	44,763,530
Total MVPD HHs with one or more OTA-only sets	18,287,493
% of MVPD HHs w/one or more OTA-only sets and DTV set (OTA capable or not)	7.2% ^b
Est. No. of DTVs in MVPD HHs w/one or more OTA-only sets *	1,316,699
Total MVPD HHs with one or more OTA-only sets	18,287,493
Mean no. of sets per MVPD TVHH with one or more Broadcast-only sets	3.40 ^b
Est. Total Sets in MVPD Homes with at least one Broadcast-Only Set	62,177,476
Less: Est. No. of DTVs in MVPD HHs with at least one Broadcast-only set *	1,316,699
Est. No. of Analog-only Sets in Households that are MVPD subs with one or more Broadcast-only set in the home *	60,860,777
3. Est. No. of Analog-only Sets in Households that are either Broadcast-only or are MVPD subs with one or more Broadcast-only sets in the home *	105,624,307
<u>Analog OTA Sets in MVPD HHs with One or More OTA-only Sets</u>	
Mean No. of Broadcast-only sets in MVPD HHs	0.32 ^b
% of MVPD HHs with at least One OTA-only Set	20.8% ^b
Mean No. of OTA-only sets in MVPD HHs with at least One OTA-only set	1.53846
Total MVPD HHs with one or more OTA-only sets	18,287,493
Est. No. of Analog OTA-only Sets in MVPD HHs with one or more OTA-only sets **	28,134,576
<u>Analog Sets in All HHs</u>	
Est. Total Sets in All Homes	286,858,704
Less: Est. Total U.S. DTV Sets *	6,396,199
Est. Total Analog Sets in All Homes	280,462,505

* Assumes one DTV set per DTV HH, an assumption consistent with the view that repeat purchasing in the early lifecycle stages of new consumer electronics is minimal. See eBrain Consumer Research, 2004 HDTV Research: Exploring Advertising Effectiveness. Debunking Consumer Confusion, p. 7.

** Assumes one DTV set per DTV HH, and assumes that DTV set is connected to MVPD service.

a) Source: Nielsen Media Research, U.S. Television Household Estimates 2003-04.
b) Source: Knowledge Networks/SRI Home Technology Monitor Survey - Spring 2004.

Demographic Characteristics of "Over-the-Air" Households

HH Characteristic	% of Group that is OTA HH	Index* vs. Total
Total U.S. TVHHs	18.9	100
Race/Ethnicity:		
White	15.9	84
Black	23.0	122
Hispanic	27.7	147
Spanish Primary Language	43.2	229
Annual HH Income:		
<\$30,000	25.3	134
\$30-49,999	18.6	98
\$50,000+	9.5	50
\$75,000+	9.0	48
High Education Level w/in HH:		
HS or less	22.5	119
Some College +	16.7	88
Age of Head of HH:		
18-34	20.3	107
35-49	19.0	101
50+	16.5	87

** Note: The above table should be interpreted as follows: 18.9% of U.S. TVHHs are broadcast-only, while 25.3% of TVHHs with annual income below \$30,000 are broadcast-only. The index of 134 means the incidence of broadcast-only HHs among this group is 34 percent greater than it is with the general population. In contrast, the index of 48 among the \$75,000+ annual HH income group means the incidence of broadcast-only HHs among this group is 52 percent less (100 - 48) than it is among the general population.*

Geographic Characteristics of "Over-the-Air" Households

County Size *	% of Total U.S. OTA HHs	% of Total U.S. HHs
"A" Counties	40.3%	35.7%
"B" Counties	28.0%	30.8%
"C" Counties	16.5%	17.2%
"D" Counties	<u>15.2%</u>	<u>16.3%</u>
Total	100	100

* **Note** : County classifications are based on Census Household counts and metropolitan proximity.
 "A" counties are heavily populated, highly urbanized areas, while "D" counties are considered very rural.

Source: Knowledge Networks/SRI Home Technology Monitor Survey, Spring 2004.

U.S. Census Region	% of Total U.S. OTA HHs	% of Total U.S. HHs
Northeast	10.9%	19.5%
Midwest	26.4%	24.4%
South	34.8%	34.9%
West	<u>27.8%</u>	<u>21.3%</u>
Total	100	100

Source: Knowledge Networks/SRI Home Technology Monitor Survey, Spring 2004.

Mr. UPTON. Mr. Willner.

STATEMENT OF MICHAEL S. WILLNER

Mr. WILLNER. Thank you, Mr. Chairman and Congressman Markey, members of the subcommittee. My name is Michael Willner, and I am the President and CEO of Insight Communications, the Nation's ninth largest cable operator. Thank you for inviting me to testify here today.

Mr. Chairman, I have said before, and I will say it again, cable is, indeed, leading the digital transition in America. When I testified before this committee last summer, I reported that cable companies were offering high-definition television on systems passing some 84 million homes. In less than a year, that number had grown to 92 million homes, almost a 10-percent increase. In fact, cable operators now offer HDTV in all of the top 100 markets and 184 of the 210 markets nationwide.

During the digital transition law, broadcasters are transmitting both analog and digital signals. Cable operators are only required, by law, to carry the analog signals. Nevertheless, cable systems now voluntarily carry an additional 504 digital signals from broadcast signals that offer HDTV and other compelling digital content. Most recent—the most recent and comprehensive of all is the example of the cable industry's willingness to carry compelling digital broadcast programming, which is the agreement announced just 2 weeks ago between the NCTA and the Association of Public Television Stations. This voluntary agreement was reached because the public broadcasters demonstrated that they have a plan to offer digital programming that is attractive to our customers. The agreement will ensure that digital programming on local public television stations will be carried on cable systems serving the vast majority of the Nation. And it was done without any government intervention.

Cable operators are also providing digital tiers that include substantial amounts of high-definition programming. For example, 18 different cable networks are now delivering HDTV, most of them on a 24-hour-a-day basis.

My company was an early proponent of HDTV and first launched high-definition television service in 2002. We carry most local HD signals in the markets we serve, provided the local broadcasters do not demand unreasonable economic concessions. We do not want our customers to have to pay for programming that the broadcaster provides free of charge over-the-air so that one neighbor pays for it and the other neighbor doesn't. Currently, 95 percent of our customers have access to HDTV.

Today, only a small portion of the Nation's households own digital televisions. Indeed, only 33,000 of our customers currently have HD service. But the good news is that we are adding more than ever before. Nearly 1,000 new customers a week, on a net basis, are adding HDTV services to their cable service. The problem is that there are still about 250 million analog television sets in viewers' homes. The large majority of over-the-air and cable households still will watch television on analog TV sets and will continue to do so well into the future.

Cable operators have introduced a digital and high-definition service plan, which gives viewers options that do not require them to purchase digital TV sets or obtain digital set-top boxes until they are ready to do so.

Ladies and gentlemen, I personally believe that the only way for this transition to ever be completed is for Congress to set a date certain. The cable industry is not in the business of deciding this matter. That is up to you. I do want you to know that we are ready, willing, and able to comply with whatever date you choose. The smooth transition will occur if you analyze the impact on two distinct consumer groups: the 90 million households who receive their broadcast signals from cable and DBS, and the 20 million who receive broadcast signals directly over the air.

Those who rely on over-the-air reception have a number of options. The least expensive option will be to obtain a set-top box that converts digital signals so that they are viewable on analog television sets. I have a favorite option. I hope those people will subscribe to cable, and we will take care of it all for them.

Cable customers, on the other hand, should not face those decisions. Whether we convert digital signals to analog at the head end or in the set-top box, the cable operator should have the flexibility on a market-by-market basis to determine the method that is least disruptive and most cost-effective for the consumer. Indeed, cable operators have been converting cable networks from their digital format received at the head end to analog for well over a decade. It is nothing new. In fact, broadcasters have, for years, been receiving digital feeds from their networks, and they convert them at their reception site into analog so they can broadcast that signal over the air.

Consumers with analog TVs will receive the same quality signal they are receiving today. By the way, contrary to the broadcasters' written testimony, no matter where we convert the digital signal into analog, at the head end or in the home, those with digital TVs will still enjoy, as they do today, the benefits of digital television signals.

Mr. Chairman, as I said earlier, the cable industry stands ready, willing, and able to participate in a seamless transition to an all digital world. You set the date. We will be there. And I thank you for allowing me to testify today.

[The prepared statement of Michael S. Willner follows:]

PREPARED STATEMENT OF MICHAEL WILLNER, PRESIDENT AND CHIEF EXECUTIVE OFFICER, INSIGHT COMMUNICATIONS

Mr. Chairman, Congressman Markey, members of the subcommittee, my name is Michael Willner. I am President and CEO of Insight Communications, the nation's ninth largest cable operator. I am also a Director of the National Cable & Telecommunications Association (NCTA) and serve on its Executive Committee. Thank you for inviting me to testify about the "The Role of Technology in Achieving a Hard Deadline for the DTV Transition," and the cable industry's efforts to advance the digital transition.

I. INSIGHT COMMUNICATIONS: COMPANY OVERVIEW

Insight Communications provides bundled, state-of-the-art services to 1.3 million cable customers living in Illinois, Indiana, Kentucky, and Ohio. The company pursues an aggressive business plan to deliver leading-edge technology to its customers and has successfully upgraded its infrastructure to support numerous advanced services including high definition television (HDTV), digital video recorders (DVR),

video-on-demand (VOD), subscription video-on-demand (SVOD), two tiers of high-speed Internet access service, voice telephony, and standard analog video. At the end of the third quarter of 2004, Insight Communications served 1.3 million basic customers; including 440,000 digital customers; 312,000 high-speed Internet customers, and 63,000 circuit-switched telephony customers. The capital investment required to make these enhancements was approximately \$500 million, a huge commitment for a company of our size.

Insight Communications was an early proponent of HDTV programming and first launched high definition service in 2002. Insight carries at least one major broadcast network in HD format in almost all of our markets. Insight carries nearly all local HD signals in all markets—provided the local broadcaster offers HD and does not demand unreasonable economic concessions that require our customers to pay for programming which the broadcaster is obligated to provide for free over the public airwaves. Currently 33,000 Insight customers have HDTV-enabled set-top boxes in their homes, and 95 percent of our customers have access to HD services (98 percent of Insight's digital customers).

II. THE CABLE INDUSTRY IS LEADING THE TRANSITION TO DIGITAL TELEVISION IN THE UNITED STATES.

Insight's investment in digital technology and its provision of HDTV and an ever-increasing array of advanced digital services exemplifies what the entire cable industry is doing to expedite the transition to digital television. Since enactment of the Telecommunications Act of 1996, the cable industry has invested nearly \$100 billion to transform its infrastructure and provide not only advanced video services but also competitive voice and data services to consumers throughout the nation. This is precisely what we said we would do if Congress established a stable regulatory environment that allowed companies to invest, take risks, and compete in the video marketplace. Congress provided impetus for the industry by passing the 1996 Telecommunications Act—and we acted accordingly.

Cable's own transition from analog to digital technology has been spurred by competitive market forces. The technological advances which have transformed our business and benefited consumers stem from cable operators risking their own private capital—without any government guarantees, subsidies, or gifting of public airwaves. Moreover, the delivery by cable operators of large and increasing amounts of high definition programming from broadcasters and cable networks has occurred without any government requirement to do so.

As the Federal Communications Commission recently noted, most television households today have a choice of at least three multichannel video programming distributors—at least one local cable operator, and two nationwide Direct Broadcast Satellite (DBS) services. Those DBS services are vigorously competing for every one of our customers. If we do not offer compelling high definition programming for the ever-increasing number of consumers with high definition television sets, we will lose those consumers to competitors who do offer such services.

A. Cable operators are now offering packages that include a full mix of broadcast, basic, and premium networks featuring HD content.

When I testified before this subcommittee last summer, I reported that as of March 2004, cable companies were offering high definition television on systems passing 84 million homes. By January 2005, that number had grown to 92 million,—almost a 10 percent increase in less than a year. Those kinds of increases cannot go on much longer, because these numbers mean that we are already offering high definition television to most of our subscribers. In fact, in all of the top 100 markets—and in 184 of the 210 markets in the nation—at least one cable operator now offers HDTV.

During the digital transition, while broadcasters are transmitting both analog and digital signals, cable operators are only required to carry the analog signals. Nevertheless, cable systems are now voluntarily carrying an additional 504 digital signals from broadcast stations that offer HDTV or other compelling digital content—a more than five-fold increase just since January 2003 (and a 32 percent increase since March 2004, when 382 stations were being carried).

Indeed, the most recent—and most comprehensive—example of the cable industry's desire to carry compelling high definition and other digital broadcast programming is the agreement, announced two weeks ago, between the NCTA and the Association of Public Television Stations (APTS). That voluntary agreement was reached because the public broadcasters showed us that they had a plan to offer digital programming that is attractive to our customers. The agreement will ensure that local public television stations' digital programming will be carried on cable systems serv-

ing the vast majority of the nation's cable subscribers—and it was done without any government intervention.

Moreover, cable operators are also providing digital tiers that include substantial amounts of high definition programming. Eighteen different cable networks are producing HD programming, including Cinemax HDTV, Comcast SportsNet HD, Discovery HD Theater, ESPN HD, ESPN2 HD, HBO HDTV, HDNet, HDNet Movies, INHD, INHD2, MSG Networks in HD, NBA TV, NFL HD, Showtime HD, STARZ! HD, The Movie Channel HD, TNT HD, and Universal HD. Unlike many broadcast stations that offer HD programming for only a few hours a day, most cable networks that offer HD do so on a 24-hour or nearly full-time basis.

B. National Digital Technical Standards Are Helping to Speed the Transition.

Along with creating and carrying compelling digital programming, the cable industry has joined with the consumer electronics industry and various organizations to establish digital standards. In December 2002, the cable and consumer electronics industries entered into a landmark agreement that set the stage for a national “plug and play” standard between digital television products and digital cable systems. As a result of this agreement, cable customers can buy unidirectional DTVs and other devices that connect to digital cable systems without a set-top box, thus allowing easy access to HDTV and other services offered by cable providers.

The agreement ensures that the next generation of digital television sets will receive one-way cable services without the need for set-top converter boxes; enable consumers to receive HDTV signals with full image quality; allow the easy recording of digital content for personal use; permit an array of new devices to be easily connected to the new HDTV sets; give access to cable's two-way services through digital connectors on high definition digital sets; and encourage manufacturers to speed the production of new sets and services for delivery to market.

In September 2003, the FCC adopted rules tracking the voluntary agreements between the cable and consumer electronics industries and imposing legal obligations on cable operators to facilitate the commercial availability of “digital cable-ready” equipment. Specifically, the FCC's rules assure consumers that cable operators will provide them with Point of Deployment (POD) separate security modules, now called CableCARDS, that will work in their CableCARD-enabled equipment purchased at retail. The FCC also required that these “cable-ready” DTV sets include digital tuners—a requirement the cable industry supported—so that owners of those sets will retain the option of receiving broadcast signals over-the-air.

As cable operators implement the “plug and play” agreement, unidirectional digital cable-ready products have made their way into the marketplace. Today, more products and innovations are clearly on the way, as evidenced by the vast array of equipment on display last month at the Consumer Electronics Show in Las Vegas. Meanwhile, discussions are continuing between the cable and consumer electronics industries to reach similar agreement on two-way digital “cable-ready” products.

III. A HARD DEADLINE FOR THE RETURN OF THE BROADCASTERS' ANALOG SPECTRUM REQUIRES STEPS TO MINIMIZE COSTS AND DISRUPTIONS FOR OVER-THE-AIR AND CABLE VIEWERS ALIKE.

Largely as a result of the marketplace forces that have required cable operators to carry packages of compelling digital and high definition programming, sales of digital and high definition television sets are increasing at a rapid pace. More than 7.2 million units were sold in 2004—a 75 percent increase over the previous year—and all signs indicate that this accelerating trend will continue in 2005.

Nevertheless, it is still the case that only a small portion of the nation's households own digital television sets. There are 250 million analog television sets in viewers' homes. The large majority of over-the-air *and* cable households still watch television on analog sets and will continue to do so for the foreseeable future. Consequently, cable operators have introduced digital and high definition services in a manner that gives viewers options that do not require them to: (1) purchase digital television sets, or (2) obtain digital set-top boxes that allow digital programming to be viewed on analog sets.

Thus, cable operators still typically provide the most popular and widely-viewed programming in analog format. This allows viewers with “cable-ready” analog television sets to watch this programming without a set-top box. Cable operators also offer optional tiers of digital program networks, as well as digital pay-per-view programming and other digital services. Most of this programming can be viewed on analog television sets in “standard definition,” but only with a digital set-top box that converts the digital signals to an analog format allowing all TVs to receive them. As previously discussed, cable operators offer digital high definition programming provided by cable networks and local broadcast stations. To view this program-

ming, customers need a high definition television set and a more complex and expensive set-top box (or a cable-ready HD set).

Today, nearly 40 percent of our customers purchase digital tiers and services. Eventually, it will be most efficient and desirable to provide all our programming and services digitally. But that will occur gradually so the consumer can choose if and when to purchase a new digital television set. In the meantime, most of our customers still have analog sets and do not purchase digital tiers. For now and the foreseeable future, we serve our customers best by making the most popular services available in analog format, even though we also provide the same services in high definition on digital channels.

When Congress sets a date certain for the digital transition, the cable industry will be ready, willing, and able to complete a smooth transition. And broadcasters could be too—if they only wanted to be. A smooth transition will occur if we recognize and deal with the different impact that ending analog broadcasting will have on two different groups of consumers: (1) people who receive their broadcast signals from cable and DBS, and (2) people who receive broadcast signals directly (over-the-air). If Congress were to require broadcasters to transmit only digital signals in the next few years, households that rely on over-the-air reception would have to incur some costs to continue watching television. They would have to: (1) replace their analog TVs with new high definition sets; (2) replace their sets with new analog TVs equipped with digital tuners; (3) obtain a set-top box that converts digital signals into analog format so that they are viewable on analog sets; or (4) become cable or DBS customers. Motorola currently estimates the cost of set-top converter boxes to be \$67 per unit. Some costs and inconvenience for over-the-air viewers will be unavoidable unless Congress is willing to wait to recapture the analog spectrum until all over-the-air viewers have replaced their existing sets—which would delay the conversion indefinitely.

Cable customers, on the other hand, need not face such costs. Cable operators, if permitted to do so, can convert the broadcasters' new primary digital signal to analog so customers who choose not to purchase new digital sets or digital tiers can continue to receive service without any additional equipment. Whether we convert to analog at the head-end or in the set-top box should be determined by the cable operator, who will decide on a market-by-market basis the method that is least disruptive and most cost-effective to the customer. Cable operators have been converting cable networks from their digital format received at the head-end to analog for well over a decade so that they can be viewed by customers without digital TVs or set-top boxes. Indeed, broadcast network affiliates have *for years* been receiving digital network feeds in digital format via satellite and fiber optic cables which they convert to analog before transmitting the programming over-the-air. The digital broadcast transition will be advanced if that same conversion right applies to local broadcast signals. Cable operators, in order to minimize the expense and disruption imposed on their customers by the digital transition, should be permitted the discretion to convert digital broadcast signals to analog at the headend. Consumers with analog TVs will receive the same quality signal they are receiving today and those with digital TVs will enjoy the benefits of the digital signals where such benefits exist.

The cable industry has already shown that where broadcasters provide compelling high definition (and/or multicast) programming, we will voluntarily carry such programming digitally *in addition* to providing the analog signal—just as we carry some popular non-broadcast cable program networks on analog channels while also carrying their programming digitally in high definition. And we will continue to do so.

IV. MULTICAST MUST CARRY

Broadcasters continue to suggest that they need multicast must carry in order to facilitate the digital transition. Their argument is a diversionary tactic and nothing more. Multicast must carry will not solve *any* consumer issue in the post-transition, digital world. Must carry simply allows broadcasters to provide any content they choose, including home shopping and info-commercials, while blocking competing services from utilizing cable's valuable bandwidth.

Multicast must-carry would have virtually no effect on the attractiveness of digital sets and would do nothing to expedite the date on which the transition might end. It is hard to see why any cable subscriber would purchase a digital set to watch additional standard definition programming that is not significantly better in picture quality than the hundreds of channels already available on cable systems. Moreover, giving broadcasters guaranteed carriage of their multicast channels will

remove their incentives to invest in and develop compelling content that consumers will want to watch and cable operators will want to carry.

Cable operators will continue to make analog televisions and VCRs work long after the broadcasters shut off their analog transmissions by providing a digital-to-analog set-top box or by converting the digital TV signals at the head-end. The only steps that need be taken in order to implement a hard deadline for the return of the broadcasters' analog spectrum are: (1) ensuring the availability of affordable digital-to-analog equipment for over-the-air viewers, and (2) permitting cable operators to convert digital broadcast signals to analog.

IV. CONCLUSION

Mr. Chairman, the cable industry has made a massive commitment to digital technology—not just to digital television but to a digital platform that will provide an ever-expanding array of competitive voice, data, and video services to American consumers. We are also committed to managing the digital transition in a way that makes the most advanced services available without imposing unnecessary costs and disruption on our customers. The government's need for the return of the analog spectrum (for important public safety and wireless purposes) means that some inconvenience, particularly for over-the-air viewers, may be inevitable. The cable industry has demonstrated, through its voluntary commitment to carry high definition programming during the transition, and its comprehensive agreement to carry public broadcasters' high definition and multicast digital programming during and after the transition, its willingness to help minimize the disruption for broadcasters and their over-the-air viewers.

We also continue to be required by law to carry the broadcasters' analog signals during the transition and their primary digital video programming streams after the transition is completed. We need to fulfill that obligation in a manner that imposes the least expense and disruption on the largest group of television viewers in the nation—i.e., our own customers, who number 70 million. We can do that if we have the discretion to convert broadcast television signals at the headend when that conversion best serves the needs and interests of local customers.

Thank you again for inviting me to testify before you today. I know that my entire industry stands ready to work with the subcommittee in its efforts to expedite the transition from analog to digital television.

Mr. UPTON. Well, thank you all for your testimony, and I want to go directly to, perhaps, a conflict between Mr. Yager and Mr. Willner in terms of your testimony. And I am going to use an example that I know well, the Upton household.

I have cable. I have four TVs. Two of them are analog, and they plug right into the wall into the cable. One is a digital set, and one is a digital HD set. The digital set and the HD set both have set-top boxes. What happens if, when we do the date, like we all want to do, the conversion is made at the head end, what happens to each of those sets?

Mr. Yager, we will start with you. What happens to my two analog sets without the box?

Mr. YAGER. Thank you, Mr. Chairman.

If the signal is converted at the head end, I am afraid both of your sets that are digital will become analog.

Mr. UPTON. What about the analog sets? Do they become digital?

Mr. YAGER. I wish it worked that way. But it—

Mr. UPTON. So that is your finding? So even with a new box, the HD set will simply perform in an analog capacity, is that what you are telling me?

Mr. YAGER. No, sir, what I said was—

Mr. UPTON. I think the chairman has an HD set as well, do you not?

Mr. YAGER. If they can—

Chairman BARTON. I have got every kind of set you can have. And I am going to talk about that on my time.

Mr. UPTON. All right. Go ahead, Mr. Yager.

Mr. YAGER. If they convert the signal at the head end to analog, which is what they propose to do to make everybody on an equal playing field, as they say, then your sets would receive an analog signal. They would no longer receive—

Mr. UPTON. So it—so are you also saying that the set-top box that I have as—for the HD set would not be able to reconvert it to digital?

Mr. YAGER. No, I didn't mean to imply that, because if you have a box at the set, which is what we propose—

Mr. UPTON. Well, that is what I have now.

Mr. YAGER. Okay. I—

Mr. UPTON. My HD set has a box.

Mr. YAGER. I do not know the answer technically if they are converting at the—my bet is they are converting at the set today. But do you subscribe to a tier of digital service?

Mr. UPTON. I do.

Mr. YAGER. And you pay extra for that tier?

Mr. UPTON. And I pay an extra small fee for the HD, about 10 or 12 stations that I—

Mr. YAGER. Then you would continue, I would think, to receive the digital service, providing they continued to feed both—keep the digital signal and the analog signal going down.

Mr. UPTON. The key is now that I have the HD service that that HD service will—I would—so what you are saying then is that the box will likely—

Mr. YAGER. The—I would think the box would work.

Mr. UPTON. [continuing] convert it, but I—it will still have HD?

Mr. YAGER. I would think the box would work, but I am not familiar with the system you are on or what the—I understand the cable proposal is to get everything to an equal playing field as they convert everything at the head end to analog. Then your box would not work.

Mr. UPTON. But a new box might be able to convert it? That is what I think that you are saying.

Mr. YAGER. Well, our proposal is—we have no problem with converting at the television set. No problem whatsoever. If digital—if cable wants to transmit nothing but digital signals and convert those to analog at the set, we have no problem with that whatsoever.

Mr. UPTON. Mr. Willner, would you like to comment?

Mr. WILLNER. Well, I would like to correct Mr. Yager, because the fact of the matter is, you know, we are transmitting digital signals right now simultaneously into analog signals, and that what we would continue to do. If we convert what is—it is just a reception at the head end issue, and if it is a digital signal, in order for people to receive them on legacy analog television sets, we would convert that digital signal to analog and there would be no degradation in signal from what they are receiving today.

Mr. UPTON. Well, that is the other question that I was going to—is the signal going to be—

Mr. WILLNER. No. You know, to call going from digital to analog a down-conversion is kind of comparing an apple to an orange. There are some issues of quality of pictures within digital where

you wouldn't consider down and up-converting, because they are different formats. But to go from analog to digital is—they are just two separate—completely separate platforms, and the consumer can choose right now when they want to convert to the advantages of digital. If we convert—we are going to convert somewhere in order to make analog TVs work. If we convert at the head end or we convert at the set-top box, nothing will change on your digital TVs. What would change if we convert—if we have to do it in the home is that we will have to supply you with a box on each of your analog TVs, which you might not have right now. So for the purpose of convenience and cost, cable operators may choose to convert at the head end to save you the inconvenience of having to have a box put in your home.

Mr. UPTON. So to summarize—I want a yes or a no. To summarize, if it is converted at the head end at my household, I will have to get two new boxes—

Mr. WILLNER. No.

Mr. UPTON. [continuing] for the analog sets?

Mr. WILLNER. No, if it is converted at the head end, you wouldn't.

Mr. UPTON. Oh, that is right.

Mr. WILLNER. Right.

Mr. UPTON. Okay. I won't need a box for the analog sets—

Mr. WILLNER. Right.

Mr. UPTON. [continuing] but I will need the proper equipment, the box for the HD and the digital set will have to be compatible to take that—

Mr. WILLNER. What you have now would continue to work.

Mr. UPTON. Should work?

Mr. WILLNER. Will work.

Mr. UPTON. Will work?

Mr. WILLNER. Will work.

Mr. UPTON. And there will not be a degradation of picture for any of the four sets?

Mr. WILLNER. For any of them.

Mr. UPTON. Is that right?

Mr. WILLNER. That is right.

Mr. UPTON. Mr. Yager, yes or no?

Mr. YAGER. I—

Mr. UPTON. Is that your understanding?

Mr. YAGER. That is not totally my understanding of cable's proposal. If that is what Mr. Willner's company is doing, then I would not argue with what he says he is doing. My understanding of what cable would like is to convert digital signals to analog at the head end so that everybody receives the same signal.

Mr. UPTON. But if I already have a box for the HD or the digital, and it is not going to—

Mr. YAGER. And you are paying extra for that box, and one of our major concerns here is—

Mr. UPTON. Well, I am now.

Mr. YAGER. Well, I—

Mr. UPTON. It is about \$3.

Mr. YAGER. One of our concerns—\$3 a month, I would take it?

Mr. UPTON. That is right.

Mr. YAGER. One of our major concerns here, you know, broadcast television converted millions of dollars to convert the transmitting digital signals with no charge to the consumer whatsoever. And a matter of fact, with very little help from advertisers to support our conversion to digital. Cable has made conversions to digital and been able to charge the consumer for that conversion. We have not. And we haven't asked to. We think it was going to a superior transmission that motivated us to support the whole transition to digital to begin with.

Mr. UPTON. Okay. Mr. Markey.

Mr. MARKEY. Thank you, Mr. Chairman.

Mr. Goldstein, I know this isn't the subject of today's hearings, but who are these families that are totally dependent upon free, over-the-air broadcasting? Can you break down for us their demographic profile?

Mr. GOLDSTEIN. Yes, I can, to some extent. The—we found that 19 percent of over-the-air viewers was—the population we are talking about, of the total, it is about 21 million. We found that on average they had about 2.1 televisions where cable and DBS viewers had about 2.7. We also found that about 48 percent of over-the-air viewers had incomes under \$30,000 compared to about 29 percent—

Mr. MARKEY. Under what?

Mr. GOLDSTEIN. \$30,000.

Mr. MARKEY. So 48 percent of these viewers are—have an income under \$30,000 a year.

Mr. GOLDSTEIN. Yes, sir. About 6 percent of them had incomes over \$100,000. 23 percent of non-white households rely on over-the-air—

Mr. MARKEY. What is that? I am sorry.

Mr. GOLDSTEIN. 23 percent—

Mr. MARKEY. Okay.

Mr. GOLDSTEIN. [continuing] of non-white households rely on over-the-air, and 28 percent of Hispanic households relied on over-the-air. Those are the figures I have with me today. There are others we could certainly provide.

Mr. MARKEY. Now, if when we put together the new government subsidy program, what would be the privacy issues that would exist in terms of identifying who these people are and making sure they get the—those—how would—we could use the cable lists to know who doesn't subscribe to cable just by knowing who gets cable. How would we work that out to ensure that we only gave the new government subsidy program over to people who had exclusively free, over-the-air as their means of receiving a signal?

Mr. GOLDSTEIN. Congressman, we are working on a much larger report for this committee for July that will get at a lot of the issues of administration and how you might administer this program, the kinds of ways in which you could conceive—

Mr. MARKEY. We don't really have until July. Could you give us a preliminary sense of how we would handle those issues right now?

Mr. GOLDSTEIN. At this point, all I can really tell you is that it—clearly, there are complications to it if you are going to—depending on the kind of list you might use, if you used the cable and satellite

lists to try and discern, you know, who does not receive it. My understanding is you can't use census data. It is pretty unclear to us right now exactly how you would proceed. It is problematic.

Mr. MARKEY. So there would be competitive issues. The cable and the—

Mr. GOLDSTEIN. Absolutely.

Mr. MARKEY. [continuing] satellite industry might not want to give us the names of the people who subscribe so we could give the money to the people who don't subscribe. You have privacy issues—

Mr. GOLDSTEIN. Yes, sir.

Mr. MARKEY. [continuing] in terms of the people whose names—that they would give us in terms of who does subscribe and might not want that to be part of a government—part of information, so it does become complicated.

Mr. GOLDSTEIN. Yes, it—

Mr. MARKEY. How much money would it take, in your estimation, to implement a program like that?

Mr. GOLDSTEIN. Well, the implementation phase?

Mr. MARKEY. Yeah, the implementation. How much would it cost?

Mr. GOLDSTEIN. We honestly don't know, at this point. In fact, the cost of the implementation—we are actually not looking at how much implementation might cost. We are looking at various options.

Mr. MARKEY. All right. If it takes until July for you to give us a report as to what the issues are, how long would it take to implement a policy that takes another 6 months just to put together the—and identify the issues much less putting into place an implementation—how long do you think it would take to put an implementation program into—

Mr. GOLDSTEIN. To identify the cost?

Mr. MARKEY. [continuing] effect? To identify cost and then—but I mean for then the Federal Government to put together a program that actually could implement the recommendations which it took you 6 months to put together?

Mr. GOLDSTEIN. It would all depend, Congressman, of course on what the Congress or the FCC decided to implement. That is part of the problem here. Until you know exactly what is to be implemented and how that would work, it is really difficult to determine how much it would cost.

Mr. MARKEY. Yeah. Well, it is a big program, though. There are—you say there are 21 million households in America relying exclusively upon free, over-the-air broadcasting while France, in its totality only has 22 million households. So it is, essentially, the job of figuring out how to have all of France get a subsidy, every single home, and make the conversion, which is no small task for the Federal Government to do in an effective way that doesn't disadvantage, especially the 48 percent that are under \$30,000 in income who may have—that is their only source of information. I mean, over \$100,000, they are going to have computers in their homes, other means of communication. But here, for the poorest, they are going to have a problem. And our Federal Government, at the end of the day, we do—this committee, we just can't say to those peo-

ple, "C'est la vie." You know. We would have to have a much more effective and readily available answer than, you know, just, "I am sorry it didn't work out for you."

So I thank you for your report. I think this is an invaluable document that outlines—begins to outline the parameters of the dilemma.

Mr. GOLDSTEIN. Thank you.

Mr. UPTON. Thank you.

Chairman BARTON. Thank you, Mr. Chairman.

And let me say at the outset, you know, I am not undecided on this issue, so I think everybody knows that.

We have more people in this country that have television sets than we have—that have telephones, and we have a universal servers requirement for telephone service that we subsidize through a fairly extensive subsidy program internally within various telephone subscribers, yet we have no subsidy for TV, and there are a higher percentage of households that have TVs than have telephones. So we are trying to debate here an issue where we know that we want to go to the digital age, and I think everybody supports that, and yet, for various reasons, some are not quite as willing to go purely digital. We still want to maintain the ability to do analog and have analog sets in service. As I heard Mr. Upton talk about how—his TVs, I got to thinking how many TVs I have purchased in the proprietor of, and I have a principle residence in Arlington, Texas, a condo in Arlington, Virginia, a principle residence in Ennis, Texas. I have two congressional offices, two campaign offices. In my personal residences, I have 15 television sets that are plugged in. Now I have three in reserve. I have a Zenith cabinet set purchased at Knox Hardware Store in Crockett, Texas in the 1970's that still works. And it is my reserve set here in Arlington, just in case the other two TV sets blink out at me. If we had no means test and we required nothing except verification that you actually had the TV set in your home, I would make a gold mine from any kind of a subsidy program they put in place to get the digital. But we are probably going to have some sort of a subsidy. And you know, the real question is what do we do for those households that are not as affluent and they only have one or two TV sets and they are all analog and they get it over-the-air, and if we don't help them when we go digital in their region, they don't get television service. And I don't think anybody, regardless of political affiliation, wants to see that happen.

Having said that, if we don't do a hard day bill, if we just leave the current law alone and do nothing, as the FCC determines that various regions in—and I am not sure how they calculate what a region is, but I know it does—it has to do with the television market. I think it is DMA. You are going to be out of luck if you are in that region, say the New York City region, and it is the first to go meet the 85 percent test, and you don't have cable or digital TV, you or satellite, you are out of luck. So I don't see why we all don't agree that there should be a hard date. Now I think the hard date ought to be what is in the current law, which is December 31, 2006.

So I guess my first question would be to Mr. Yager. What happens if we do nothing? What happens to these sets that—in low-

income families that have no capability when the region meets the 85-percent test right now? What do we do? Or what do they do?

Mr. YAGER. Well, Congressman, we want to work with you as badly as you want a hard date. But your constituents are our viewers. And our concern is exactly what you have just described. What happens to the people who rely totally on over-the-air television? Are we going to disenfranchise them from total television? Or is there a plan that can be set in motion, which we are very willing to work with the Congress on, to get to a—some kind of way to convert these 20 million sets, whether it be through a box that converts digital to analog or whether it be some kind of subsidy program or some method. But to set a date, at this point in time, seems to me to be beyond the kind of scope that we can deal with until we get full—

Chairman BARTON. Well, I mean, we have a date. The date we have—it is a soft date, because it is an either or, and I will tell you one more story and then my time is about up. My wife, thinking that I was under TV-ed, gave me a voucher for Christmas for \$300 for a new TV set. And so we went to Best Buy, you know, in January. They were having a sale, and we walked in, and we went over and got a salesman. And the salesman said, “What do you guys want?” And I said, “I want the best TV I can get for \$300.” And so they started showing us all of these analog sets. You know. A 28-inch set, I mean, really nice sets with the clicker and the whole bit. I said, “Well, what about these digital sets over here?” “Oh, no. You said you wanted the best set you could get for \$300. And those are all \$700 and \$800 sets and more.” And I said, “You know, I heard that Congress is probably going to, you know, do something about that.” And he said, “No, they will never get around to doing it. You want this set right over here.” And so I bought a \$300 analog set. And it is in my bedroom in my home in Ennis, Texas right now. It is this huge thing. I mean, you know—so I mean we have got to do something, because they are going to keep selling those sets, because they are basically—the analog sets, it is just the cost of materials and shipping. There is no technology innovation in them. And there is a big price differential. I mean, it is double.

My top-of-the-line TV set is a 42-inch plasma screen with every gadget you can get on it, so, you know, I am not purely a Zenith guy from the 1970's. I have one that is high-definition all of the way.

Thank you, Mr. Chairman.

Mr. UPTON. Did you get picture-in-picture on the \$300 set?

Chairman BARTON. I did not. I don't think I did. I may have. My daughter could tell you or my stepdaughter.

Mr. UPTON. That way you can watch the Aggies in Texas, too, so—

Chairman BARTON. I don't want to watch that until I know the Aggies will win.

Mr. UPTON. Yeah.

Chairman BARTON. Thank you.

Mr. UPTON. The gentleman from Illinois, Mr. Rush.

Mr. RUSH. Thank you, Mr. Chairman.

I want to welcome all of the witnesses this morning. I want to ask all of you all a question, and respond as you will. Do you all

agree that the consumers have a right to know that they are—as the chairman eluded to, that their purchased—newly purchased sets will only have a limited use? And would you—I am going to take a little—a step further. Do you think that we should adopt some type of a warning label on these analog sets, alerting the buying public that their sets will go dark at a certain time?

Mr. YAGER. I would be happy to answer that, because in my testimony, Congressman, I thought it was unconscionable that 30 million sets were analogs sold last year without any warning to the consumer that they could soon be obsolete. So the answer is yes, I most definitely think the consumer electronic industry should start labeling analog-only sets as, perhaps, being obsolete in a short period of time.

Mr. RUSH. Mr. Goldstein.

Mr. GOLDSTEIN. Sir, I would actually answer probably just slightly broader, which is in the work that we have done in digital television. When we went to and examined Berlin last year for this committee, one of the things we found was that consumer education was absolutely critical to achieving the transition in an orderly and quick way. And they provided a lot of information from a lot of different sources. Both the government provided information as well as the industry itself. And so the sooner the information on the pending transition can occur once the particulars are settled, the better off I think everyone is going to be.

Mr. RUSH. Dr. Kim.

Mr. KIM. If the specific dates that, you know—the hard date is on—hard date is specified and that we support and we definitely have to educate, you know, consumers as these, you know, analog sets are obsolete in certain date.

Mr. WILLNER. Congressman, the only thing I can add to this is that, for cable subscribers, whatever TV they buy, it won't become obsolete. We will be able to deliver service on the day of the transition. But I do think that, you know, if a hard date is set, it becomes more of a reality and it is just easier to communicate to the American consumers exactly what is going to happen and when it is going to happen.

Mr. RUSH. Okay. I—

Mr. YAGER. If I may follow up just 1 minute on that, we have had a hard date, or the parameters of a hard date, for a number of years, since 1996 and sets are still not being labeled that this set could soon be obsolete. I don't think it has to say it will be October 1, 2006 or October 1, 2007, but the truth of the matter is, and I think the Congressman had said this, these sets are lasting 15 to 18 years today.

Mr. RUSH. Mr. Willner, assuming that the following is, indeed, a fact, we have a consumer who gets their digital signals through cable or DBS and they have not purchased a digital television. And like many consumers, they fall on hard times, laid off from a job, job moves out, and somehow they are not working anymore. So therefore, they have got limited income, more limited than they had when they had the digital sets. And they can't pay their cable bill or their satellite bill. Will their sets go dark if, in fact, they can't pay the bill, cable or satellite bill?

Mr. WILLNER. Well, I don't believe so. First of all, most cable companies, I think virtually all cable companies, have service available, which is basically an over-the-air antenna service in the \$10 to \$12 a month range. So if they wanted to reduce their cable bill and still receive the over-the-air signals, plus others like CSpan and other basic services, they would be able to reduce service down to that price range. In a world where the electronic device that Dr. Kim was talking about is available, and I do believe that the cost of that device will be significantly less than \$100, maybe less than \$50. Nobody could have ever convinced me 4 years ago that a cable modem would only cost \$50 in the retail market today, but standards allowed that to happen and technology allows that to happen. I do believe a converter will be able to transmit—translate digital signals to analog by simply plugging it in, putting it on top of the TV set in the \$50 range. So I do believe there will be alternatives for people to continue to get television after the analog frequencies are turned off.

Mr. RUSH. So you are saying, under no circumstances—you are confident that, under no circumstances, will, say, the 41 percent of folks who are cable subscribers whose income is under \$30,000? Is that—was that correct? Did I hear that? Under no circumstances will these individuals ever have a television set and it would—and there would never be a time that a television set would go dark? Is that what you are saying?

Mr. WILLNER. I think they have very, very cost-effective alternatives to keep that television set working.

Mr. RUSH. Okay. Thank you.

Thank you, Mr. Chairman. I yield back.

Mr. UPTON. Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman. And I thank my colleague from Chicago. It is an interesting point. I don't know if we got the answer right, or at least I don't understand whether there will be a time, if we go to full digital transmission, and someone has an analog TV with an antenna that they will no longer receive a signal. That—I think that is my colleague's question.

Mr. YAGER. It is my understanding, Congressman, that the consumer electronics industry is going to work on a box that will convert digital to analog, which should be a low-priced purchase for the consumer.

Mr. SHIMKUS. Or in the spectrum auction, I mean, that is the debate on the Berlin model in giving the—but his question doesn't address that. His question is, I think—and Bob, you can jump in, if you want, I think his question is, right now, is there a time, if we go to—if we are going to digital signal, and you have an analog TV and you are not plugged in and paying a \$3 fee, and you are just—will, under that premise, you will no longer receive a signal?

Mr. YAGER. If we have a hard date to turn the analog transmitters off, that is correct.

Mr. SHIMKUS. Okay. And so our debate is how to limit the political damage, the cost issue, the Berlin model that we discussed in hearings last year, and some people have mentioned today about using the spectrum sales to get the boxes to the consumers who are not going to pay to upgrade themselves in that issues. And so I just wanted to follow up on that.

And my colleague, Mr. Markey, he went over the demographics, Mr. Goldstein, but I had to leave the room for a minute. And I—was there a discussion on the urban and the rural differentiations of the breakout of services?

Mr. GOLDSTEIN. No, Congressman. It was mainly dealing with the income levels and some of the ethnic and kinds of issues like that. We may have those breakouts. We don't have them in this particular report. And we could certainly—

Mr. SHIMKUS. If you could check into that. That is going to be very important to—

Mr. GOLDSTEIN. Absolutely.

Mr. SHIMKUS. [continuing] a lot of, you know, folks who have large rural areas.

Mr. GOLDSTEIN. Right.

Mr. SHIMKUS. When I used to represent Quincy, I had 19 counties. Now I represent 30 counties. I border Missouri, Indiana, and Kentucky. So it is a large area. And it is—they are not—I know my friend, Mr. Willner, would like to service them all with cable, but the reality is it is not going to be—there is no great economic return to go to some communities where they have 75 residents. So I mean, they are serviced by other providers, but they are also serviced by some local broadcast entities that—so I think that will help us in the debate, and I don't know if that calls for us to submit another letter or—

Mr. GOLDSTEIN. No, I think we have some of that material. It is just simply not in this particular rendition.

Mr. SHIMKUS. Great. And I also would like to follow up on—just ask Dr. Kim a question, and I hate it when everybody is asking around the question, but I think this is an interesting debate. Talk about the production of the set-top boxes, the capital expense that is portrayed, and the need for some certainty to ramp up, to provide a product at a given time, and the risk entailed if there is not a set time for which you can do that, raising the—just—I think it is important for—a lot of times for us to understand that it is not easy. One of the problems with trying to manufacture something that the government is dictating, and the broadcasters understand this, is that there is always uncertainty and we don't—government never provides certainty for you all. Talk about the challenges in trying to get these set-top boxes to the consumer in a credible price range.

Mr. KIM. Thank you, Congressman.

Certain manufacturers needs at least, you know, 12 to 16 months lead time to make a new product. So we need that absolute time beforehand, okay. And I think the major portion of the, you know, cost reduction will be chip set, how we can reduce components in very simple, one chip solutions. So we need chip development of at least 6 months. So if we have, you know, time specified, 12 to 18 months ahead of time, we have plenty of time to make that set-top box available to consumers.

Mr. SHIMKUS. Thank you.

My time has expired, Mr. Chairman. Thank you.

Mr. UPTON. Mr. Terry.

Mr. TERRY. Thank you.

That is a good question about a warning on the set. And as a lawyer who actually did a couple of cases involving warnings, I was trying to figure it out in my mind. I think it goes something like, "Advisory: due to congressional mandate, there may or may not be a digital transition in the future, so you may or may not need additional equipment, like a set-top converter box, at some time in the future." And I am not sure that is a very good warning right now. If we did have a hard date, it would be a lot simpler to write, but we have to come back with the fact that it is not necessarily obsolete to have an analog set. It is just that they are going to need an additional piece of equipment to operate that TV. Which brings me to my high-definition TV set with my cable operator of which I need a set-top box to operate it. In fact, I have a set-top box on the analog sets. So we did go through a period in our television history of cable converter box, then the plug-and-play sets, and for some reason, we are back into, in this digital transition, a set-top box on every TV. So I am not sure how, really, difficult this transition will be. It will be difficult on a class of individuals, I think, who are over-the-air users who do not have the economic means, perhaps, to buy a \$50 set-top box converter.

So the issue, then, becomes how do we focus on them. That was the focus of my opening statement. And Mr. Yager, I want to ask you a question. We have heard the term "market forces" and "market solutions" here, and I am trying to figure out what that means in the digital transition. What that means is that the government is not going to subsidize the consumer to purchase the converter box, or at least that is how I interpret it when we say that we will rely on market forces. Then who does pay for that converter box? It is either the consumer or you, as the owner of the broadcast television station, whose consumer doesn't use the cable industry to receive the signal. So my question to you is if you want your viewers to see a commercial, at least in Omaha it is 90 percent car dealers, if you want that local car dealership or Nebraska Furniture Mart ad to be seen, because that is your revenue source, isn't it in your best interest to figure out how to get a set-top box to that consumer?

Mr. YAGER. Congressman, having, at one point, been involved with the NBC station in Omaha and knowing that we spent over \$1.5 million to put the digital signal on the air, we feel we have gone a long way to implementing the digital transition across the United States. I think most broadcasters have made similar kinds of commitments to getting digital out to the public. For us now to be asked to pay for a converter box so viewers could see it, to me, was never part of the original plan for digital to begin with. And I might say that—going back to cable, let us just talk about cable's role in this for a minute, it is my understanding that in the 1992 act, cable was required to carry basic broadcast signals on their basic tier. Cable now has an upcharge, and I am getting back to answer your question. Cable now has a basic upcharge for getting a digital signal. We have no ability to receive a second revenue stream, nor do we intend—nor do we want one, at this point, to deliver a digital signal to our viewers.

Mr. TERRY. Channel three in Omaha, which would have been your competitor then—

Mr. YAGER. Yes, it was.

Mr. TERRY. [continuing] the CBS affiliate will not allow Cox Cable or any cable station to rebroadcast their HD, and the only way you can get their digital HD signal is by an over-the-air antenna that costs about \$300. I only have 8 seconds left. Same question to the cable industry. I have been told by smaller cable companies that they think it is unfair that their customers may have to have a set-top box, and they don't want to incur the cost. So they are encouraging us to also include in the digital transition buying the cable company's set-top box for the consumer as well, which I think is an outrageous request. But what are your feelings on that?

Mr. WILLNER. Well, I don't agree with that. I think, you know, we—if we have a subscriber, and they are going to pay us a monthly fee, we will do what we have to do to make that television work.

I would like to point out, if I might, just very briefly, that the cable industry has spent not millions of dollars per cable system, but hundreds of millions and billions of dollars to get ready for the digital transition, and we did not ask for this over-the-air transition. The broadcasters asked for the over-the-air transition. You know, it is a very common occurrence to bring cable into the debate, but cable is just kind of raising its own money. We spent \$100 billion, close to \$100 billion as an industry converting to digital service. We are doing it for business purposes. We think it is the future of television viewing, but we did it with our own raised capital, our own equity and our own debt. We didn't come to the government for any favors for this, no tax incentives, no frequency space over the air. And I think that to come back and ask us to do even more for broadcasters is really just going above and beyond what we should be doing for our consumers.

Mr. YAGER. Could I respond to that just a minute?

Mr. UPTON. Quickly.

Mr. YAGER. It is my understanding that cable has been able to recognize a return on their investment in the transition of digital through the cost to the consumer, yet television does not charge the consumer for the use of the over-air signal.

Mr. UPTON. Mr. Wynn.

Mr. WYNN. Thank you, Mr. Chairman. I will waive.

Mr. UPTON. Mr. Towns.

Mr. TOWNS. Thank you, Mr. Chairman.

Dr. Kim, in your testimony, you note that converter boxes will be available for sale in the \$50 to \$70 range in a little over 3 years from now, assuming sales volume is 10 million units or more. Are these assumptions based on your company receiving a sole source contract to manufacture these converter boxes?

Mr. KIM. I beg your pardon, sir?

Mr. TOWNS. I mean, are these assumptions based on your company receiving a sole—

Mr. KIM. No, sir; we are not—our company is not in a position to say on subsidy issues. Basically, what I am talking about currently available—this is HD set-top boxes. And you know, a \$50 set-top box would be like this and with a small power supply. Okay. So you know, market—the volume is—the cost is the function of the time and the volume. Okay. So while I am talking about \$50 in 3 years, it starts like this.

Mr. TOWNS. But if Congress implemented a rebate program and other companies manufactured the boxes for sale, would competition drive the price down? If Congress implemented a rebate program and everybody is allowed to manufacture them, would it drive the prices down?

Mr. KIM. I think so, yes. This is not—our company does—certain manufacturers will be willing to make the set-top boxes available to the consumers.

Mr. TOWNS. Are there any electric property rights that would pose a problem to competition for these products?

Mr. KIM. No, sir.

Mr. TOWNS. As a national consumer of electronic company, you have familiarity with distributing your product across the country. But does even a company as large as yours have sufficient relationships with enough retailers nationwide that all consumers would have easy access to a store selling the converter box?

Mr. KIM. Yes, sir.

Mr. TOWNS. A television can last a long time, even though all TVs by July 2007, of course, must have a digital receiver. TVs will be around for a long time to come. As consumers upgrade their TVs, these TVs might move from the family room to a spare bedroom where it needs to get an over-the-air reception. Do you envision making the converter box for the long term, or would you phase the product out after the initial rush of purchases?

Mr. KIM. Well, if you receive the HD signal through analog TV sets currently available, then definitely you need the set-top boxes. And also, easily, this is very—you know, interface. You can connect any current available analog TV sets. It doesn't matter what it is.

Mr. TOWNS. It is flexible?

Mr. KIM. Yes.

Mr. TOWNS. Let me ask you, Mr. Goldstein. What do you think would be more efficient in getting low-cost converter boxes to the public: a sole source contract, one manufacturer, or competition?

Mr. GOLDSTEIN. We haven't looked at that question, Congressman. I am not really sure. It strikes me, just off the top of my head, that competition, because it would—if you had sufficient volume and enough players in the market that that would help to drive prices down. And the work we are still doing for the committee now, we have done a number of interviews and talked to quite a number of manufacturers who have indicated to us that they are willing to manufacture these boxes and that the price ranges probably would be in the \$50 to \$100 range.

Mr. TOWNS. All right. If we implemented a subsidy program, would consumer electronic stores be able to handle such a credit?

Mr. GOLDSTEIN. They might. One of the things we are looking at is how you could implement various programs, and we are examining a number of options and talking to people about how best to proceed in this kind of an area, because there are a lot of ways that you could proceed. There are tax credits. There are rebates. There are vouchers. There are a whole variety of methods that one could utilize to get a subsidy across, as well as a more direct distribution approach. When we did our work in Berlin last year, of course, it was a subsidy in the way of a voucher that was provided to people in the low-income group from the welfare office, the social welfare

office. But again, that was—you know, the Berlin model was obviously different. It was a much smaller number of households involved.

Mr. TOWNS. All right.

Thank you very much, Mr. Chairman. I yield back.

Mr. UPTON. Mr. Bass.

Mr. BASS. Thank you, Mr. Chairman.

10 years ago, consumers could buy an IBM clone computer, personal computer, not an IBM, with a 386 SX Intel chip, and it only had DOS loaded on it, no Windows. And that system could cost as much as \$1,500. But it wasn't a year before you couldn't buy any software for that computer. You had to buy Windows upgrade. You had to—Windows 3.1. And then it wasn't long after that before it wouldn't—you couldn't put any spreadsheets on it unless you had a 486 SX, or whatever the other initials were, and then you couldn't connect that to the Internet without a Pentium. And then you couldn't get past the year 2000 without doing something else to it. And I upgraded a—I would have upgraded—I wasn't stupid enough to buy that computer then, but the—I would have upgraded without any subsidy or anything else, and now we are—you know, computer costs have come down. So I was wondering if each one of you would be willing to reflect upon that process and explain to me what the difference is between that and what we are facing today with the digital conversion date.

Mr. WILLNER. I think the American consumer is far more comfortable with change in technology than it ever has been in the past, and I think they will become increasingly comfortable with those changes. And I would also just, you know, once again point out that cable subscribers are not going to have to do anything on that date. And you know, the vast majority of the American public does receive their television signals through either a cable company or a DBS company who will not have to lift a finger.

Mr. YAGER. Well, I would agree with Mr. Willner that the public has become very receptive to change in technology. And we want them to become even more, kind of, acceptance of the digital transition, because we have made millions of dollars of investments in converting our stations to digital. But I am concerned about that 20 million number of analog-only sets and the cost of a converter box so that all Americans can afford to continue to receive over-the-air television without having to pay a cable subscription fee.

Mr. KIM. Our goal is to make it consumer-friendly and simple interconnections. And you know, currently, cable TV is into TV sets and integrate the sets that we are making. But very simple, that is possible.

Mr. GOLDSTEIN. I think that people are more savvy when it comes to technology and more likely to make investments. They go to the stores and see a whole variety of things that they can purchase that sort of glitter before them, and I think people are increasingly savvy about it. I think at the same time our research has shown that not everyone is going to be willing to do so. Our report reflects that some analog people are not—quite a number are not going to be willing to, you know, probably purchase cable or satellite and that some cable people are not all that interested in obtaining new boxes and the like. At the same time, there is the

policy question for Congress of how to deal with the lower-income people.

Mr. BASS. Well, of course, right. And I am not responding to your point, but faced with the choice of being able to have access to the Internet or getting an upgrade, there was a tremendous amount of demand that was created for that upgrade, and the cost of that upgrade became very small. So just to follow up on that, you all are probably familiar with the computer analogy Moore's law. And since we are approximately 22 months away from the 2006 deadline, what is to say that this whole debate over a \$100 or a \$300 set-top converter is going to be rendered obsolete for the very reasons that you, Mr. Goldstein, started to elude to in the answer to my first question?

Mr. GOLDSTEIN. I mean, I guess I would say it is the—you are possibly quite right. I think we—I would say we don't know. It is clear that, as time goes on, more people are going to buy digital televisions a lot more, and you know, that will sell—

Mr. BASS. How about you—

Mr. GOLDSTEIN. That will solve part of the problem.

Mr. BASS. —Dr. Kim? You are in the electronics business. What—can you answer that question?

Mr. KIM. Well, I think, you know, the digital conversion is, you know, the inevitable trend and—

Mr. BASS. Do you agree with my contention that there may—this may be an irrelevant debate?

Mr. KIM. Well, it is somewhat related, okay, but I don't believe it, the majority of the consumers don't know how to hook up some complicated devices, so—

Mr. BASS. Just like hooking up a computer. Okay.

Mr. KIM. Yeah, and—

Mr. BASS. I yield back, Mr. Chairman.

Mr. KIM. [continuing] we would like to make an interconnection as simple as possible—

Mr. BASS. Okay.

Mr. KIM. [continuing] for consumers.

Mr. UPTON. Mr. Boucher.

Mr. BOUCHER. Mr. Chairman, for the moment, I will pass if someone else has questions.

Mr. UPTON. Mr. Gonzalez.

Mr. GONZALEZ. Thank you very much. My apologies for being absent during most of the testimony and the questions, so I am just going to assume that a whole lot has already been covered, and I don't know if this particular aspect of it, and I think it—the problem will take care of itself. In the meantime, though, it does present a real problem in frustrating the progress that we have made with—that is the transmission of the digital signal so that cable can, in fact, carry it. The big news in San Antonio was that the Super Bowl was not going to come with high definition, and the reason for that, that particular broadcaster was not digitally transmitting to the cable company. All right. So you had the capability or the broadcaster, but it wasn't happening anyway. And I guess I just—and I am just going to read part of it, because I think there is good argument to be made on both sides of this thing. And you know, we start getting into multi-cast, we start getting into must

carry, and all of these arguments. And somehow, we have to factor all of that in as we move forward and see if some of these things are going to be resolved. And I don't know if a—some people say a drop-dead date. I would rather say it is a date certain for the conversion, if it takes care of some of this. But in the meantime, we all believe in market forces, and we are looking to you to work something out so that we don't come in with our own answer. But I wrote a letter, and I was inquiring. My poor public is not going to see this. "Thank you for your letter concerning availability of our digital signal to the public. We believe that the consumer has every right to receive our DTV signal and they can for free." I emphasize "free". And then, of course, they start talking about over-the-air. "As for the cable companies not offering our signal, they certainly can if they are willing to pay a fee. As you are aware, our industry has invested a fortune in building out DTV stations." This particular company has spent in excess of \$150 million and has yet—has seen no business model to recoup this investment. "The cable industry, as I am sure you are aware, charges the public for essentially everything they supply, and they, in fact, pay substantial dollars to content providers like ESPN, Fox News, and hoards of others so they can offer their service to the consumers. Our view is simple: if you want our content, treat us like other content suppliers and everybody wins. If not, the consumer, as always, has the choice to watch for free." And so, Mr. Yager, I would like just, I guess, your view on where we are today, where all of this is going in the negotiation, what happens if you have a date certain. And again, I really do appreciate your views.

Mr. YAGER. All right, sir.

First of all, let me speak to the situation, and I am not familiar with the situation in San Antonio regarding cable carriage, but we have had ongoing discussions with the cable industry for, I think, probably the last 3 years where we have made no progress whatsoever, either in terms of multi-cast carriage or carriage of digital as part of the basic service they offer to their subscribers. Yes, they are willing to carry a digital tier, and Mr. Willner's company itself carries our digital signal, but there is a \$12.95 surcharge if you subscribe to that digital service. So the position of the broadcasters is relatively simple: we want to be carried on the cable systems. Individual broadcasters have the right to negotiate retransmission fees under the law if they are going to allow cable to carry their signals. And so I can't speak to the specifics of what happened in San Antonio. But we don't even, at this day and time, have the right to the carriage of our digital signals on cable systems. They will carry one stream and one stream only. Mr. Willner's company, obviously, in Peoria, Illinois, carries two streams in the chairman's home district. He receives both a digital signal and an analog signal. But that is two streams he is carrying. We requested and were turned down dual must-carry carriage. We wanted both the analog signal carried and the digital signal carried. This is all part of this whole transition that we have got to address. It is very confusing to the consumer, and then you top on that the 20 million sets that aren't connected to a cable system whatsoever.

Mr. GONZALEZ. May—I have about a half a minute, so Mr. Willner.

Mr. WILLNER. There is a lot of confusion around this. The fact of the matter is the way that we are carrying Mr. Yager's digital signal is that we are also carrying his analog signal, taking up the bandwidth on the cable system. So all consumers that subscribe to cable in Peoria, Illinois get both of his signals. There is a lot of confusion, that is there is a lot of noise around this issue. The fact of the matter is cable operators want to carry the primary signal of all broadcasters. If broadcasters want to multiplex and want us to carry multiple signals, all we want them to do is to come to us and tell us like the public broadcasters did, what is the plan, will it work for our consumers, we—should we utilize valuable bandwidth in order to provide you with access through the cable system, and we will do that, just like we did with the public broadcasters. But what the commercial broadcasters don't seem to want to do is come up with the plan and show us exactly what it is they have in mind.

Mr. GONZALEZ. Well, I thank you all very much. And not to speak for the chairman, but I know that it is just not the chairman, but there is a point where this committee has an obligation and a responsibility to move forward if you guys in the—you know, the vested parties, the, as I say, stakeholders don't resolve it. And we encourage you to start moving quickly.

Thank you very much.

Mr. UPTON. Ms. Blackburn.

Ms. BLACKBURN. Thank you, Mr. Chairman.

And thank you to our panel. I appreciate you all being here, and I appreciate the discussion today.

Mr. Kim, I think I would like to come to you first and ask a question. You mentioned in your response to—I think it was either Mr. Shimkus' or Mr. Terry's question, that you needed a 12 to 16 month lead-time for production of a converter box. And so what I would like to know is if you are currently manufacturing a box. And then we have talked a little bit about what the anticipated cost would be. There are—I have heard you all say \$50. I have heard you say \$100. And I apologize, I have been in and out of the room just a little bit. What you think the cost would end up being and then the third part of that question would be how you all plan to market and educate on the use of that box. So if you would lay those out for us if you are currently producing what you anticipate, your retail cost being, and then your marketing information education plan.

Mr. KIM. Thank you, ma'am.

We are thinking the cost would be in the range of \$60 to \$70. That is based upon the volume of tens of millions of units. And that—assuming, also, we need 12 to 18 months lead-time basically to develop and deploy that technology. Okay. Right now, as I showed before, this is current—currently available set-top boxes that decode HD, okay, solutions. But I am proposing within 3 years replacing this box with small, like this. And also, the consumer education is very important to sell our product. And with our salesmen and most of the retail chain, the, you know, staff, we have very—education suggestions throughout the country. And I think that they will talk about our new product to our needy customers in the retail chain. And this is, you know—definitely, we have the program to educate consumers, and we are planning to have this

product available if those volumes are available in the right time. But we have to get the lead time as early as possible.

Thank you.

Ms. BLACKBURN. Thank you.

You know, in my town hall meetings in my District, one of the No. 1 questions that comes up is: "Is my TV going to be completely dark?" And "How much is this going to cost me?" And I would just suggest to you all that for many of my constituents and the conversations that we have had, they consider the purchase of a top-box another tax that they are having to pay. And so we are sensitive to that issue. And I appreciate your comments. Thank you, sir.

Mr. Yager, we have heard from some of our broadcasters, and they talk a little bit about how they have built out their digital transmission systems. And one of the things they see as being a problem, as we move forward into 2006 and 2007, is the—maybe the ready—readily available or the lack of digital production studios. And I am just curious. Are you seeing this—are other broadcasters seeing this as a problem, that there is a lack on the production end of digital studios?

Mr. YAGER. I—Congresswoman, I don't know that there is. I think almost all production equipment sold today is digital. We built 7 years ago, in Quincy, Illinois, which is the 168th market in the country, a total digital facility. It is totally digital. Now it is not high definition, and I want to make that very clear going in. There is a difference between high definition and digital pass-through equipment that we produce. But every news clip we shoot at the three stations we own is now done digitally.

Ms. BLACKBURN. Okay. Thank you, sir.

Mr. Goldstein, page two of your testimony, you have a comment there, second paragraph, "While a subsidy for set-top boxes might be one policy option to spur the transition, there are other policies that might do so as well." Do you want to elaborate on what you think some of those other policies may be?

Mr. GOLDSTEIN. Congresswoman, for the report that we are doing for the committee, we are going into a lot of those issues. For the purposes of today, we were really coming just to set out what the subsidy issues were. We will be prepared to talk about those in more detail as we finish our work.

Ms. BLACKBURN. Thank you.

I appreciate that, Mr. Chairman. I yield back.

Mr. SULLIVAN [presiding]. I thank you. I would like to yield to the gentleman from Virginia, Mr. Boucher, for 5 minutes.

Mr. BOUCHER. Well, thank you very much, Mr. Chairman.

Mr. Goldstein, I would like to pursue with you clarification of several facts, and the shorter your answers can be to these questions, the better, from my perspective.

I would just like for you to confirm several numbers relating to the potential for a government subsidy, for converter boxes, for analog set owners after the digital transition is complete. First of all, are these numbers correct? The number that I have is that there are 73 million sets in the U.S. that are analog that rely on over-the-air delivery, that 45 million of those are in households that are over-the-air only where there is no cable or satellite sub-

scription, and the balance of those would be in cable or satellite-served households where a second or third or fourth set relies not on the cable or satellite subscription but on over-the-air delivery. Are those numbers accurate?

Mr. GOLDSTEIN. We think they are roughly accurate. We can get those figures for you.

Mr. BOUCHER. Rough is good enough.

Mr. GOLDSTEIN. We can get it for the record for you.

Mr. BOUCHER. I know you are not going to go count every one, so that is—if they are roughly accurate, that is good enough for me.

Now the range of converter box cost is a key question, and I heard Mr. Kim say that—his estimate, I believe he said, is \$62 to \$70, is that correct, Mr. Kim?

Mr. KIM. Yes, sir.

Mr. BOUCHER. Mr. Goldstein, do you concur in that, or do you have any other estimates?

Mr. GOLDSTEIN. The work that we are doing for the committee, we have talked to a number of manufacturers that have told us that they are likely to be involved in manufacturing boxes, and the range most of them—I think we have talked about 10 to 12 companies so far. We are continuing our work still, so we are not done, but most of them have fallen into the \$50 to \$100 range. There have been one or two on either side of that.

Mr. BOUCHER. Mr. Kim, would you agree that that is possible?

Mr. KIM. Yes, sir. It is definitely a function of the volume and time.

Mr. BOUCHER. Okay. Thank you.

Mr. Goldstein, again, do you have any estimate, based on the research that you have done, of the number of owners of analog sets that depend on over-the-air delivery, and I am using the full 73 million set number for purposes of this question, who would, upon the termination of analog broadcasting, decide to purchase digital sets? What I am looking for is the number of sets that are analog sets that would have to be equipped with converter boxes if we are not to strand any equipment. So do you have an estimate of the number of sets where the owners would basically surplus those analog sets and purchase digital sets?

Mr. GOLDSTEIN. I don't think we do, but I would say that there is nothing that would suggest to us that people who have analog sets today are going to be any less inclined than other people to purchase digital.

Mr. BOUCHER. Well, the answer is we don't have that number.

Let me ask you about another number. Do you have any estimate of the amount of dollars, the number of dollars that an auction of the analog spectrum by the government would produce for the government?

Mr. GOLDSTEIN. We don't. We have talked with folks—with a number of individuals who are experts in this area, and as you know, the industry has widely varying figures for the cost. What we all, I think, recognize, is that a hard date is going to add some certainty to the issue so the value would rise.

Mr. BOUCHER. Well, the estimate that I have heard at the low end of the scale is about \$4 billion. Do you have any reason to contest that number?

Mr. GOLDSTEIN. I don't have any reason one way or another just to say we have heard—

Mr. BOUCHER. Okay.

Mr. GOLDSTEIN. [continuing] a range of—

Mr. BOUCHER. All right. That is fine. Mr. Goldstein, thank you for the research you have done. That is very helpful to us. If you do further research on any of these questions, we would very much welcome the results of that research.

Mr. Willner, in the brief few moments I have remaining, let me just ask you the questions I have here for you, and I will ask them all at once and give you an opportunity to respond. These are pretty simple things, really.

I am interested in knowing what is going to happen at the cable household when the analog signal gets turned off. And here are the precise questions I would appreciate you addressing.

First of all, do you intend that the analog household will get a down-converted digital signal that presumably you would down-convert at the cable head end and then send analog across to that home? And that is question one.

Question No. 2, will the households with digital sets get a complete high-definition digital signal? Can people, when they purchase their sets, anticipate that they are actually going to be getting high definition brought to them over the cable system?

And question No. 3, will the households that have both digital and analog sets be able to receive, over cable, both a digital signal and an analog signal, so that they can continue, through their cable subscription, to have both their analog and digital sets served?

Mr. WILLNER. Briefly, yes, yes, and—no—

Mr. BOUCHER. Yes, yes, and no, did you say?

Mr. WILLNER. Yes, yes, and yes. No—

Mr. BOUCHER. Yes, yes, and yes?

Mr. WILLNER. [continuing] analog conversion, which is really just a change of format. It is not a down-conversion, per se, will allow us to provide service to every cable subscriber after the transition. The question is whether we convert it at the head end or at the set-top box. If it is at the set-top box, there may be an additional box put into a cable-ready analog television—

Mr. BOUCHER. Well, bear in mind a lot of these subscribers don't have set-top boxes.

Mr. WILLNER. Right.

Mr. BOUCHER. They wouldn't want to have to acquire one.

Mr. WILLNER. That is right. So if we can do it at the head end, which we already do with all of our cable networks, then there would be no change at all in a regular analog household.

In a digital household, they will continue to get the digital signals that we are already providing.

Mr. BOUCHER. Even with the down-conversion for analog?

Mr. WILLNER. Even with the conversion to analog, it would be two streams going out at the same time.

Mr. BOUCHER. All right. And so the answer to question three would therefore be yes?

Mr. WILLNER. That is correct.

Mr. BOUCHER. All right. Thank you, Mr. Willner.

Thank you, Mr. Chairman.

Mr. SULLIVAN. Thank you. The gentleman from New York, Mr. Fossella, for 5 minutes.

Mr. FOSSELLA. Thank you.

Welcome.

In all of this, one of, I guess, the ultimate beneficiaries of a transition will be public safety agencies across the country, and, by extension, the public. Enhanced communications, perhaps interoperability, better able to protect the public. For example, New York City police departments, fire departments, and other first responders are waiting anxiously for this transition to occur to allow these agencies to, again, enhance the ability to communicate with each other, between and among the agencies to protect the public. Why should they wait any longer than is necessary as part of this—as this process unfolds? Is there any justification for it?

Mr. YAGER. If you would like, I will respond, Congressman.

Mr. FOSSELLA. Sure.

Mr. YAGER. We would love to see the transition to digital sooner rather than later, but the consumer isn't involved in that transition. And the interests of the public, in terms of being able to continue to receive television, have to be viewed side by side with the interest of public safety. Most commercial television stations offer public service the time and efforts in any case of emergency. Most of the time, we do continuous weather coverage when there are serious weather situations. Our involvement in amber alerts are also extremely important, we think, to public safety. Our cooperation—our existing cooperation with police and fire departments are very critical to that whole public service issue. But we believe that you have to consider the consumer as well as the public safety issues and come up with a resolution. And as I said earlier, the broadcast industry is willing to work with the Congress to achieve those objectives.

Mr. FOSSELLA. Well, and those are all admirable and noble and the broadcasters across the country, I know, perform a great public service in disseminating information as it relates to public safety. This speaks to, more than that, the operational aspect of the business, but by that, I mean actually allowing the agencies to obtain and to utilize a spectrum that will—has nothing to do with the broadcasters, per se, it has to do with themselves. And I guess as much as we want to address the issues of consumers, I am not minimizing that, I just happen to believe personally that the most important responsibility of government and the Congress is to ensure that the people are protected to the best of our ability. So I hope that criteria is not minimized in this debate at all. That should be, and must remain, paramount to any of these economic discussions.

Does anybody else have any comments on that? If not, I yield back.

Thank you.

Mr. SULLIVAN. Thank you.

Mr. Engel from New York for 5 minutes.

Mr. ENGEL. Thank you, Mr. Chairman. And I would echo what my friend from New York, Vito Fossella, just said about the interoperability problem.

Mr. Chairman, I would just make a brief statement before I would ask my question, and I am very happy that we are getting to work here on our efforts to spur the transition to digital television.

The broadcast industry has made a great deal of progress and just a few years ago just dozens and then a few hundred stations were transmitting in digital, and today, we have more than 1,300 stations doing so. The consumer electronics industry has made progress as well with a little push from the FCC. There are now many TVs on the market with digital tuners, and by 2007, virtually all will include a DTV tuner. So I believe most of the technical problems have been addressed, but there remains, obviously, a number of policy issues for the 20 million families that rely on free over the time, half of whom earn less than \$30,000 a year should not be harmed, or we face, as I have said many times on this committee, our own political peril. Thus, I don't believe that a 2006 deadline is possible.

And second, as Mr. Fossella mentioned in the past, New York continues to heal from the wounds of September 11. Our broadcasters have done work to get back on the air, though not at full power and not reaching the same distance as they did from the World Trade Center, thus, depending on what date is chosen for a shut off, the New York area may need some extra time.

And finally, I want to return to an issue that this committee has looked at in the past, the problem of protecting content in the digital age. Writers, filmmakers, and the other creative talent who bring us that content are entitled to be fully compensated for their efforts, yet they are already being financially hurt, just the way musicians and songwriters, unfortunately have been. If we complete the transition to digital television without providing some protection of being uploaded onto the Internet, then content producers will have a disincentive to produce new digital content. So I am concerned that there are machines already being manufactured that allow a digital TV signal to be converted to an analog format and then redigitized for mass redistribution. The current law doesn't guard against it, so we must encourage the film, computer, and electronics industries to work together to solve this problem, because if they don't, then a true digital transition will be pushed even further off into the future.

I would like to welcome the panelists, and I would like to ask Mr. Willner, recently public television and the NCTA struck a deal for carriage of the many offerings that public TV will have in the digital age. NCTA is to be strongly commended for its efforts, and I was just delighted to see that. And I want to say that publicly. I am really happy that the cable industry has come to a voluntary agreement on this. And for many years I was urging this, because I could see the value in these offerings, such as an adult learning channel and all the—toddler's channel and things like that. So this didn't really get a lot of press, so I was hoping that you could provide some details of this for the record for this hearing.

Mr. WILLNER. Thank you, Congressman.

The NCTA and the Association of Public Broadcasters came to this agreement because they—the broadcasters came to us with a plan. And they showed us that they had a plan that was attractive

to our consumers, and the industry came together with the public broadcasters and agreed to carry not only their HD signals but multiple streams, multi-cast some of their signals as well. The only debate we have with broadcasters here is whether or not that particular function should be a function of government or a function of business. And if the commercial broadcasters wanted to sit down and have a discussion about a plan that works for consumers in our markets, on a market-by-market basis nationwide, we are happy to sit down as an industry to have that discussion and do what we did with the public broadcasters and do what we did with the consumer electronic industry, and that is come to a voluntary agreement.

Mr. ENGEL. Thank you. Thank you very much.

Mr. Goldstein, it is my understanding that, in addition to a converter box, an over-the—correct me if I am wrong, an over-the-air television household would also need an antenna to which—to—through which to receive the signal. Do your estimates of a government subsidy include the cost of an antenna as well?

Mr. GOLDSTEIN. They do not, sir. And you are right. Our understanding is that you would need the antenna as well, and they range in cost. They can be \$300 or more, depending. Some are lower, but it—we do not include the cost of an antenna. We do not include the cost of what any kind of technical assistance households might need to have the set-top box installed if they can't do it themselves, that sort of thing.

Mr. ENGEL. So if we are really going to put out the prices there, we need to include this as well. I thought it was important to get that out there.

Mr. GOLDSTEIN. Those are additional costs, yes.

Mr. ENGEL. Thank you.

Thank you, Mr. Chairman.

Mr. SULLIVAN. Thank you.

I yield myself some—to ask some questions, 5 minutes.

Mr. Willner, if you convert digital signals at your end, the head end, so that they will work for subscribers with analog televisions, who will need set top boxes, and who will need set-top boxes if you converted the set-top? And also, how much will these cost?

Mr. WILLNER. If we convert at the head end, no consumer will have to add a box or change a box. If we convert at the set-top box, as opposed to the head end, consumers who currently have cable service, analog cable service on what is called cable-ready televisions who do not require boxes, would then require a box.

Mr. SULLIVAN. Okay.

And Dr. Kim, in your testimony, you state that consumers who use digital-to-analog converter boxes will get improved, crisp, studio-quality pictures. Does this mean that even consumers with analog televisions will be better off than before the transition if they use a converter box?

Mr. KIM. Yes. You can—full digital advantage, so no ghosts, and you know, just a very crisp—and those fuzzy noise symptoms will disappear. And those—I think I would like to comment on the antenna issue. If you are using currently an antenna, analog antennas and digital antennas are the same thing. And you can use the same antenna in your household.

Mr. SULLIVAN. Did you say how much those were? Do you know?

Mr. KIM. The—currently—you mean, the antenna?

Mr. SULLIVAN. Yes.

Mr. KIM. No difference between analog antennas and digital antennas. Okay. So you can use—you can buy a \$5, you know, bow-tie antenna. You can use that for digital televisions. And—yes.

Mr. SULLIVAN. Thank you.

Mr. Wynn, you have 5 minutes.

Mr. WYNN. Thank you, Mr. Chairman.

Mr. Goldstein, have you contemplated the necessity or need for a public education program to explain all of this to the general public? And if so, what would be the cost of such a program? And also, who would—who should be responsible, in your opinion, for that program?

Mr. GOLDSTEIN. Congressman, the work that we are doing right now for the committee—it is not part of today's report, but we are doing work already that is trying to ascertain just what would be required in a, sort of, public service program and a consumer education program. When we did work last year for this committee and went to Berlin to examine how the transition in Berlin occurred, one of the things that we did find was, among the most critical elements of their success was a very strong consumer education program that most of the stakeholders had a part in. There were, you know, banners on televisions, but they also had a shorter period of time, too. The—their simulcast period was quite short. And I think that probably helped them as well. But absolutely. We believe that a consumer education program—

Mr. WYNN. So you will be giving us more information on that?

Mr. GOLDSTEIN. Yes, sir; we will.

Mr. WYNN. The second question I have is I have heard the discussion of, perhaps, 200 percent of poverties are cutoff for the government subsidy. Is that, in fact, what is being contemplated by your office, and if so, what is the rationale for that determination? Because as my colleague said earlier, this is going to sound like a tax. And I am sure that there are people who are above that level who would also feel put upon to pay this tax. What is your—how would you analyze this problem?

Mr. GOLDSTEIN. We actually aren't taking any position on this at all, Congressman. We simply used, for the purposes of doing our work, a 200-percent and a 300-percent level of poverty to ascertain, you know, what different levels of support might be—

Mr. WYNN. Have you done a model that basically says this is the number of people that will require a subsidy, not taking into consideration any policy analysis relative to poverty, just said this number of people will be affected, and will need converter boxes?

Mr. GOLDSTEIN. If you did not—yes, I—the report you have today shows that if you did not use a means test and you just talked about the number of people who had to get a set-top box for an analog—for their analog television, and assuming just one television per household.

Mr. WYNN. Well, how does it go to this? What would be the number for just assuming one television? And then what would be the number if we assume, say, two televisions?

Mr. GOLDSTEIN. Well, the number for—if you were assuming one, it would run—and there is no means tested, it would be between \$1 billion and \$2 billion essentially, depending on what the cost of the set-top box was, which is either—somewhere between \$50 and \$100.

Mr. WYNN. So that is \$1 billion to \$2 billion in cost?

Mr. GOLDSTEIN. Yes.

Mr. WYNN. For how many units? That is one unit for how many people?

Mr. GOLDSTEIN. For 20.8 million.

Mr. WYNN. 20.8 million? Okay.

Let us see. Mr. Yager, the cable industry basically said they want to do business. They want, rather than have a governmental imposition of the multi-casting regime, they want to have you negotiate with them. What is wrong with that?

Mr. YAGER. Not a thing, sir. We have tried, on numerous occasions, to reach agreement with the cable industry regarding carriage of our signals, regarding multi-cast. Cable enjoys its role as the gatekeeper to what the public can see that we broadcast free over the air. And you heard Mr. Willner say they want to control what we air. They want to control what we put out to the public. And we, as a television station, have never answered anybody but the public interest in terms of what we program.

Mr. WYNN. Can I interject just a question? Are you basically saying they are not negotiating in good faith over issues—

Mr. YAGER. I was—

Mr. WYNN. Over issues beyond—right.

Mr. YAGER. I can't say that they are not negotiating in good faith, because I was not part of that negotiating team, but I do know that there have been committees of the NAB MSTV that have met with the NCTA and those negotiations have not resulted in an agreement.

Mr. WYNN. Are there sticking points other than price of how much you would have to pay for that? Is it mostly over content?

Mr. YAGER. It is mostly over content. Yes, sir.

Mr. WYNN. Okay.

Mr. YAGER. You have got to remember that—I think the NCTA, the PBS deal was a wonderful public relations move. They cut a multi-cast deal with the PBS stations with somebody that doesn't compete for the local advertising dollar. The reason we can't get to a multi-cast deal is we compete in our local markets with cable for the local advertising dollar. And for them to control the content that we can put out free over the air is unacceptable to us in any kind of negotiation.

Mr. WYNN. Okay. I see you shaking your head, if the chairman would indulge me just to get a rebuttal, if that is permitted.

Mr. WILLNER. Thank you, Congressman.

I was a part of that negotiating team between the NCTA and the broadcasters, and the issue does come down to the broadcasters seeking out a dual stream of revenue, which was not part of their business model. It is not part of the contract they had with the public for use of the public airways. They want to extract additional money out of our consumers' homes where they don't have—

where they don't extract it out of people who choose to put up antennas.

Mr. WYNN. So you say it is money?

Mr. WILLNER. I say it is money.

Mr. WYNN. Okay.

Mr. WILLNER. It is not about how much they are going to pay us. It is about how much they want us to pay them for the same signal they send out for free over the air. And that is the fundamental breakdown. The fact of the matter is, we have a lot in common in serving the American public, and we could come together as two industries and do just that if we have legitimate discussions about the use of valuable band width so that broadcasters don't have a particular advantage over A&E or Oxygen or all of the cable networks that come and show us business plans that make sense for our consumers. If you give them a free ride on a cable system, the content will be less good than it would be if they had to prove to the consumer that this is something that they would really want.

Mr. WYNN. Okay.

Thank you, Mr. Chairman.

Mr. SULLIVAN. I recognize the chairman of the Energy and Commerce Committee for a point of personal privilege.

Chairman BARTON. I think that—thank you, Mr. Chairman. And I am not going to take long, but I am going to have to leave, and before I leave, I just want to say, since this—we have heard—learned of the announcement that Mr. Fritz is going to be leaving NAB, it think it would be very unfair if, as the chairman of this committee, I didn't tell him and the people he represents what a privilege it has been to be associated with him in the 20-some odd years that I have been in the Congress. He is a gentleman of integrity and character and has represented his industry with fairness and honor. Going back to the Cable Deregulation Bill, the Home Satellite Bill, the Telecommunications Act, and many, many others, he hadn't won them all, but he has always represented his industry's position in a way that kept the doors open on both sides of the aisle. And whatever Mr. Fritz does in his next career, he is going to be remember very fondly in this committee. And I want to say thank you for the way you have presented your industry's positions in the time that I have been in the Congress.

Mr. SULLIVAN. Thank you, Mr. Chairman.

I recognize Ms. Wilson from New Mexico for 5 minutes.

Ms. WILSON. Thank you, Mr. Chairman.

I—on this issue, I think I have a—may have a slightly different perspective in that all of us represent, you know, where we come from. And in New Mexico, while Albuquerque has a fairly high penetration of cable, rural New Mexico is less so. And we—when I look at your statistics, Mr. Goldstein, of kinds of households that are very low on the penetration of digital television, it sounds like a cross-section of New Mexico, a much lower per capita income, high percentages of Hispanic Americans. And so I have to say that setting a date certain is not particularly attractive in the State of New Mexico, because there will be so many people who are low income whose televisions may go dark.

I also—I look at these numbers. You know, here we are in a budget battle where we are talking about health care and edu-

cation and where we, you know—how we are going to meet the needs of this country, and we are talking as though, you know, \$1 billion or \$2 billion or \$4 billion for boxes on top of television sets is no big deal. And I think it is a big deal. And I would like to ask where do you think where do you think we are going to get the money from? Does anybody—where is the money going to come from? The sound of one hand clapping here is a—Mr. Goldstein, I mean where do we get the money?

Mr. GOLDSTEIN. I am not sure that I really have an answer for you, Congresswoman. It is a policy question that Congress really has to struggle with, obviously, and this whole hearing has been about that, about whether or not, you know, you do subsidize and at what level do you subsidize and the like. But I certainly don't have an answer of where in the budget you might find this money.

Ms. WILSON. I think that is a real problem. And it is particularly a problem in New Mexico when the alternative is that folks won't have their TVs work anymore. And when we approach that time, we are going to have a really serious problem, which is why setting a date certain, I mean, not convinced at all is the right thing to do. And in New Mexico, 85 percent penetration is a long way off. I have heard various estimates, but I haven't heard one get to double-digits yet in the percentages of households in New Mexico that are ready for digital.

I wanted to follow up on something Mr. Engel said, and I have to say that the voluntary agreement is—that cable has reached with public television, one of the first local agreements was in New Mexico. It was in Albuquerque and was very satisfactory to the public broadcasters as well as to the local cable operator and will probably frame some great services to people in New Mexico. And so I wanted to commend you on negotiating those agreements. Maybe market by market is the best way rather than trying to sort that out at a national committee kind of level between two very strong interest groups and that maybe this can be sorted out community by community rather than two industries going around big mahogany tables in Washington, DC. So I wanted to commend you on your local work in solving local problems with these kinds of agreements.

Thank you, Mr. Chairman.

Mr. SULLIVAN. In response to Ms. Wilson's cost, it is my understanding that Chairman Barton will introduce a hard date bill that raises the auction revenues necessary to pay for the subsidy.

Ms. WILSON. Mr. Chairman.

Mr. SULLIVAN. Yes.

Ms. WILSON. We have auctioned that spectrum and used that money several times over in various budgets, and you know, we act as though that is our money to use in this committee. And it—those priorities are set nationally. And if we use \$2 billion of spectrum auction money to pay for boxes on top of TV sets, that is \$2 billion we are not using to immunize kids or to make sure kids can read or to buy body armor for our soldiers. These are important decisions, and I think we are going to have to treat them very seriously.

Thank you, Mr. Chairman.

Mr. SULLIVAN. I recognize Mr. Markey from Massachusetts for 5 minutes.

Mr. MARKEY. I thank you very much, Mr. Chairman.

We have a dual tuner mandate that the FCC belated put on the books so that we at least end a policy of selling TV sets that the government intends to render obsolete. The dual tuner mandate starts with the larger TV sets and scales down to 13-inch sets with the requirement that these smaller sets have the capability of receiving and displaying digital signals by July 1, 2007. Have you done any analyses that, recognizing that we sell some 30 million TVs annually in the United States, that under the dual tuner mandate, how many of the 21 million households will obtain a dual tuner set under the ordinary course of events, and especially how many would get a new TV on their own with digital capability, especially once the 13-inch mandate arrives in mid-2007?

Mr. Goldstein.

Mr. GOLDSTEIN. We haven't done any specific analysis of this issue, Congressman, but I mean, I think just from a—well, one could argue from the extrapolation standpoint if there are, you know, 120 million households and, you know, 25 to 30 million new televisions in, you know, $\frac{1}{4}$ of the over-the-air people were to buy a set, you know, in a year, that is a lot of—that is certainly a lot of television sets every year. We haven't done any specific analysis of that point.

Mr. MARKEY. But what would you think, Mr. Goldstein, though, is the likelihood that if we sell 25 or 30 million sets a year over the next 3 years that x number of consumers in this category will have purchased a new digital TV set or one that is capable of receiving a digital signal and converting it?

Mr. GOLDSTEIN. Some certainly will. Obviously, there is a larger than average percentage of them that are of a low-income nature, so it may not be as many as from other categories.

Mr. MARKEY. So you are saying that it—for many of the poorer people, and that is almost half of all of the people in—that are totally dependent upon free, over-the-air television, that if they had a TV set that was 5 years old, and that is one decision they could make to continue for another 5 or 10 years, and they wouldn't necessarily be going out into the market looking for a new TV set.

Mr. GOLDSTEIN. It is true. It is hard to predict, but because there is a—you know, such a substantial number of them who are poor, I think that is a real issue.

Mr. MARKEY. Okay. Good.

Could I ask each of you just to give us the 30 seconds you want us to remember as we are leaving here today? What is the one core nugget that you want the committee to maintain as we are now moving to—more actively into this area?

Mr. Willner. Good to see you, by the way.

Mr. WILLNER. Good seeing you, too. Thank you.

I would like the committee to know that the cable industry is prepared to move forward with the digital transition whenever you folks are ready to declare it. A hard date is, I think, important. We don't have a hard date now because there is that caveat of 85 percent and nobody really knows what that 85 percent means, which is one of the reasons why I think the manufacturers aren't really

embracing putting dual tuners and digital tuners into television sets. So when you get on with the business of converting the Nation's airwaves to digital, we will be there, and we will be providing service seamlessly to our subscribers the day after.

Mr. MARKEY. Thank you.

Mr. Yager.

Mr. YAGER. I think what I would like you to remember is the impact that any decision this committee makes has on the consumer, your constituents, our viewers, and the impact the digital transition will have on them.

Mr. MARKEY. Okay. Thank you.

Mr. Kim—Dr. Kim.

Mr. KIM. As a consumer electronics manufacturer point of view, we are very anxious to this transition quickly move on, and we can make television sets available at an affordable price to the consumers.

Mr. MARKEY. Thank you.

And Mr. Goldstein.

Mr. GOLDSTEIN. I think the hearing this morning really showed that there are a tremendous number of issues that have to be grappled with and answered, a lot of policy issues before the committee and the Congress. And the work that we have started to do for you and that we will finish up in the coming months, hopefully, will help you reach those conclusions, and we are happy to continue to take on other work related to this, as the committee wishes.

Mr. MARKEY. Yes or no: can we get this done by January 1, 2007? Yes or no.

Mr. Goldstein.

Mr. GOLDSTEIN. Yes.

Mr. MARKEY. Dr. Kim.

Mr. KIM. Yes.

Mr. MARKEY. Mr. Yager.

Mr. YAGER. No.

Mr. MARKEY. Mr. Willner.

Mr. WILLNER. The yeses have it three to one, sir.

Mr. MARKEY. I thank you.

And Mr. Yager, I understand your position. I am a Democrat in the House, so I sympathize with you. Thank you.

I thank you, Mr. Chairman.

Mr. SULLIVAN. Thank you, Mr. Markey.

I would like to thank the panelists for being here today. Thank you very much. It was very insightful. This hearing is adjourned.

[Whereupon, at 12 p.m., the subcommittee was adjourned.]