

# EXAMINING THE OBAMA ADMINISTRATION'S SOCIAL COST OF CARBON ESTIMATES

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## HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY POLICY,  
HEALTH CARE AND ENTITLEMENTS

OF THE

COMMITTEE ON OVERSIGHT  
AND GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRTEENTH CONGRESS

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## EXAMINING THE OBAMA ADMINISTRATION'S SOCIAL COST OF CARBON ESTIMATES

Thursday, July 18, 2013

HOUSE OF REPRESENTATIVES  
SUBCOMMITTEE ON ENERGY POLICY, HEALTH CARE &  
ENTITLEMENTS,  
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,  
Washington, D.C.

The subcommittee met, pursuant to call, at 2:43 p.m., in Room 2247, Rayburn House Office Building, Hon. James Lankford [chairman of the subcommittee] presiding.

Present: Representatives Lankford and Speier.

Staff Present: Joseph A. Brazauskas, Majority Counsel; Sharon Casey, Majority Senior Assistant Clerk; Ryan M. Hambleton, Majority Professional Staff Member; Scott Schmidt, Majority Deputy Director of Digital Strategy; Jaron Bourke, Minority Director of Administration; Beverly Britton Fraser, Minority Counsel; Devon Hill, Minority Research Assistant; and Safiya Simmons, Minority Press Secretary.

Mr. LANKFORD. The committee will come to order.

I would like to begin this hearing by stating the Oversight Committee mission statement. We exist to secure two fundamental principles. First, Americans have the right to know that the money Washington takes from them is well spent and, second, Americans deserve an efficient, effective Government that works for them.

Our duty on the Oversight and Government Reform Committee is to protect these rights. Our solemn responsibility is to hold Government accountable to taxpayers, because taxpayers do have a right to know what they get from their Government. We will work tirelessly in partnership with citizen watchdogs to deliver the facts to the American people and bring genuine reform to the Federal bureaucracy. This is the mission of the Oversight and Government Reform Committee.

Again, I apologize for starting a little bit late. We had votes on the Floor, then came over as quick as we could. There will be other members that will join us in the moments that are ahead.

A few years ago, a small group of Government employees from various agencies gathered for a series of meetings on the social cost of carbon. These agency representatives determined that earlier estimates on the social cost of carbon were incorrect. The previous estimate, done three years before, was wrong, apparently by 50 percent. In 2010, the Government believed that carbon emissions cost the Nation \$22 per ton. Now the interagency working group believes the cost is \$33 per ton.

It takes many mathematical calculations to arrive at a social cost of carbon estimate, and we are not here today to make sure that the interagency working group knows how to do its math. Rather, we are here today to determine how they arrived at the updated social cost of carbon, if the process was transparent, and how this updated cost will be used.

When the rules and the cost estimates change, typically agencies release data for review and comment. Federal agencies do not and cannot know everything. This review process provides an essential opportunity for them to gain synergistic wisdom of the Nation, especially something that will have great effect on the economy.

The social cost of carbon will affect the cost of electricity, every home and business, the cost of our cars and trucks, the cost to heat our homes, the cost of food, the cost of every product that is manufactured and transported in America. This is no simple rule change with little effect; this has especially serious consequences for everyone on a fixed income and anyone with limited resources.

While I assume some will try to deflect my questions of why and how this cost has changed for every American with rhetoric that Republicans just want dirty air and dirty water, and we want children to have breathing problems and global catastrophes, the facts could not be further from the truth. I want a healthy environment for everyone. But I also think everyone must follow the law.

Today is a conversation with the Administration's lead regulator on the rulemaking process and authority possessed by this Administration to change the cost of every product in America. I do not think it is unreasonable to ask how this rule changed, why it changed, what is the science behind the change, who made the rule, and why it came out right now.

I hope that today's hearing, and any that may follow, will bring into light how this Administration sets the social cost of carbon so that the American people and this Government can be partners in creating a Nation that can power itself effectively, efficiently in the future, and on our own environment.

With that, I yield to my ranking member, Ms. Speier.

Ms. SPEIER. Mr. Chairman, thank you for holding today's hearing, and thank you to Mr. Shelanski for being here to respond to questions that we may have.

Americans are feeling the impacts of climate disruption, from destructive and deadly storms like Hurricane Sandy, floods, droughts, and some of the largest wildfires in history. It is almost biblical. Cleaning up after climate-driven disasters cost nearly \$100 billion last year, one of our largest non-defense, discretionary budget items. That works out to be an average of over \$1100 per taxpayer. It is clear we not only have a moral obligation to protect future generations from climate change; we must do it for sound economic reasons.

Despite what some may say, there is sound science behind the impact of carbon in climate change. According to the National Academy of Sciences in 2011, climate change is occurring, is caused largely by human activities, and poses significant risk for a broad range of human and natural systems. The preponderance of the evidence points to human activities as the most likely cause for

most of the global warming that has occurred over the past 50 years.

This year, the non-partisan experts at GAO added the issue of climate change to their biannual high risk report. Now, this is truly significant. The GAO is independent, it is nonpartisan, and it placed climate change in its high risk category for us to review. The high risk report details the most pressing fiscal challenges facing the Federal Government.

GAO found that climate change poses particularly significant financial risks to the Nation's economy, warned that our Government "is not well positioned to address this fiscal exposure," and recommended a "Government-wide strategic approach with strong leadership and the authority to manage climate change risks."

Laura Tyson, of the Haas School of Business at UC Berkeley and a former chairwoman of the Council of Economic Advisors under President Clinton, wrote in *The New York Times* in May, "There is much debate about what the proper social costs of carbon might be, but there is no debate that carbon emissions are seriously underpriced."

Today's hearing examines part of the Obama Administration's effort to listen to the best available science to create a monetary estimate of the cost of CO<sub>2</sub> emissions and incorporate that scientific knowledge into a Government-wide approach to manage climate change risks, as the GAO recommended we do.

Prior to 2008, reductions in CO<sub>2</sub> emissions were not valued at all in the federal cost benefit analysis. The process of establishing a social cost for carbon was actually begun in the Bush Administration, after the 9th Circuit Court, in a challenge to a regulation, chastised the National Highway Traffic Safety Administration, in 2007, for assigning a social cost of carbon of zero dollars in setting fuel economy standards. The court noted that the NHTSA's failure to account for carbon contrasted starkly with its willingness to quantify equally indeterminate costs and benefits like traffic noise and energy security. The court declared the rulemaking arbitrary and capricious.

In 2010, an interagency panel consisting of prominent scientists and economists from the Department of Agriculture, Commerce, Defense, Environmental Protection Agency, among others, developed the first estimate of the social cost of carbon. In May 2013 that figure was updated and, not surprisingly, the cost estimate rose. The interagency working group explained the reason for the increase, that is, what the best available science now tells us.

In listening to the best available science, the interagency working group was simply complying with the law, which states, quoting from the Executive Order 12866 in 1993, "Federal agencies shall assess both the costs and benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs and base its decision on the best reasonably obtainable science, technology, economics, and other information concerning the need for and consequences of the intended regulation."

There are those who criticize the way the estimate was calculated. Of course, there is room for disagreement with any proc-

ess, but for those that do, I challenge them to bring their own suggestions on how to improve the process. What I would not agree with are those critics who advocate that we make no estimate. That would be a colossal mistake for any of us in a position of responsibility to make.

If we fail to adequately prepare for climate change, billions of dollars in Federal, State, and local investments in public infrastructure will be threatened. I am proud that California has been a leader in reducing CO2 emissions. In fact, while in the State senate, I voted for AB-32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emission reduction goal. That bill was signed into law by Republican Governor Arnold Schwarzenegger. One State cannot do it alone.

I have already exhausted my time, so I will complete my testimony and extend my remarks for the record.

Mr. LANKFORD. That would be just fine. Any other members can also have seven days to submit opening statements for the record.

We have one panel and one individual on the panel today. The Honorable Howard Shelanski is the Administrator of the Office of Information Regulatory Affairs, the Office of Management and Budget. Been there a very long time, eight days now, I believe, is that correct? So glad that you are here. We are going to get you started in a good conversation here in this way.

Pursuant to committee rules, all witnesses are sworn in before they testify, so if you would please stand and raise your right hand.

[Witness responds in the affirmative.]

Mr. LANKFORD. Thank you. You may be seated.

Let the record reflect that the witness has testified in the affirmative.

The way this typically works, and you have been around through confirmation hearings and everything else at this point, but there will be a clock in front of you. Your written testimony that you have already given us, thank you for that, will go into the record, then your oral testimony will supplement that as well.

You have five minutes, but we will have a conversation here in the time to come. You don't have to worry that much about the clock at this point. If you have additional comments, we allow you to be able to do that. So thank you, and begin now.

#### **STATEMENT OF THE HONORABLE HOWARD SHELANSKI**

Mr. SHELANSKI. Thank you very much. Chairman Lankford, Ranking Member Speier, and members of the subcommittee, thank you for the opportunity to appear before you today. I was recently confirmed as the Administrator of the Office of Information and Regulatory Affairs, known as OIRA, at the Office of Management and Budget, and I am honored to be serving in this role. I look forward to speaking with you today about the social cost of carbon.

When I refer to the "social cost of carbon," often called SCC, I mean the values used to calculate the monetary costs and benefits of incremental changes in the volume of carbon emissions in a given year. The social cost of carbon includes, for example, changes in net agricultural productivity and human health, property damage from increased flood risk, energy system costs, and the value of ecosystem services lost because of climate change.



Executive Orders 12866 and 13563 direct agencies to use the best available scientific, technical, economic, and other information to quantify the costs and benefits of rules. Rigorous evaluation of costs and benefits has been a core tenet of the rulemaking process for decades through Republican and Democratic administrations. This fundamental principle of using the best available information underpins the Administration's efforts to develop and update its estimates of the social cost of carbon.

In 2009, the Administration launched a process to determine how best to quantify the net benefits from reducing carbon dioxide emissions. The purpose of this process was to ensure that agencies were using the best available information and to provide consistency in economic analysis associated with the rulemaking process across agencies. During the previous Administration and at the beginning of this Administration, agencies used a range of social cost of carbon values when evaluating the costs and benefits of rules.

To determine how best to quantify the net benefits from reducing carbon dioxide emissions, the Administration first conducted a preliminary assessment of existing literature in order to set interim social cost of carbon values while it worked on a more comprehensive analysis. Informed by public comments received on rules in which agencies used the interim values, the Administration developed and released improved SCC estimates in February of 2010 in conjunction with a Department of Energy appliance efficiency-standard rule for small electric motors.

Since the release of the SCC values in February 2010, numerous rulemakings have used those values for the social cost of carbon. Agencies using the SCC values in rulemakings received extensive public comments, many of which focused on the discount rates chosen and the three peer-reviewed academic models used to develop the SCC estimates.

As explained in the February 2010 Technical Support Document, the SCC methodology rests on three integrated climate change assessment models: the FUND, DICE, and PAGE models. These models combine climate processes, economic growth, and interactions between the climate and the global economy into a single modeling framework. These are by far the most widely cited models that link physical impacts to economic damages for the purposes of estimating the SCC. The SCC estimates rely on a common set of inputs to each model and equally weigh the outputs of the three models, as described in detail in the 2010 technical document.

Recognizing that the underlying climate change impact models would evolve and improve over time as scientific and economic understanding increased, the 2010 SCC documentation committed to regular updates, and set a goal of updating the SCC estimates within two years or after updated versions of the underlying models became available. Since the February 2010 estimates were released, the three models that underpin the interagency social cost of carbon estimates have been all significantly updated and subsequently used in peer-reviewed studies.

Many public comments urged the agencies to update the estimates based on the latest models. It is important to note that the only changes made in May 2013 to the SCC estimates reflect the refinements made to the underlying models by the people who de-

velop and maintain those models. In other words, all of the changes to the social cost of carbon value were the result of updates to the FUND, DICE, and PAGE models that were made by the model developers themselves. The Federal Government inputs, such as the discount rate, climate sensitivity distribution, and socioeconomic trajectories like population growth used to develop the 2010 estimates remain unchanged.

As explained in the 2013 Technical Support Document, the updates to FUND, DICE, and PAGE reflect, among other things, improvements in the way economic damages from climate change are modeled. The net result of these updates to the three peer-reviewed models was to increase the SCC estimates. These net changes reflect many specific changes within the three models, some of which increased the estimates and some of which decreased them.

Entities outside the Federal Government are using estimates that are similar to the updated SCC values. For example, these updated estimates are consistent with the values used by other governments, such as the United Kingdom and Germany. Major corporations, such as ExxonMobil and Shell, have also used similar estimates to evaluate capital investments.

The Administration will continue to investigate ways to improve the social cost of carbon estimates. The current estimates will be used in the economic analysis of rulemakings, and we fully expect comments on the SCC values in the context of future rules. We will consider those comments to ensure that we use the best available information to evaluate the costs and benefits of our regulation.

Thank you for your time. I would be happy to answer any questions.

[Prepared statement of Mr. Shelanski follows:]

**EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
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**TESTIMONY OF HOWARD SHELANSKI  
ADMINISTRATOR FOR THE OFFICE OF INFORMATION AND REGULATORY AFFAIRS  
OFFICE OF MANAGEMENT AND BUDGET  
BEFORE THE HOUSE COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM  
SUBCOMMITTEE ON ENERGY POLICY HEALTHCARE AND ENTITLEMENTS  
UNITED STATES HOUSE OF REPRESENTATIVES**

July 18, 2013

Thank you for the opportunity to appear before you today. I was recently confirmed as the Administrator of the Office of Information and Regulatory Affairs (OIRA) at the Office of Management and Budget (OMB), and I am honored to be serving in this role. I look forward to speaking with you about the social cost of carbon.

When I refer to the “social cost of carbon” (SCC) I mean the values used to calculate the monetary costs and benefits of incremental changes in the volume of carbon emissions in a given year. The social cost of carbon includes, for example, changes in net agricultural productivity and human health, property damage from increased flood risk, energy system costs, and the value of ecosystem services lost because of climate change. Executive Orders 12866 and 13563 direct agencies to use the best available scientific, technical, economic, and other information to quantify the costs and benefits of rules. Rigorous evaluation of costs and benefits has been a core tenet of the rulemaking process for decades through Republican and Democratic Administrations. This fundamental principle of using the best available information underpins the Administration’s efforts to develop and update its estimates of the social cost of carbon. Indeed, cost benefit analysis better informs decision makers if it takes into account the current and future damages from carbon pollution.

In 2009, the Administration launched a process to determine how best to quantify the net benefits from reducing carbon dioxide emissions. The purpose of this process was to ensure that agencies were using the best available information and to provide consistency in economic analysis associated with the rulemaking process across agencies. During the previous Administration and at the beginning of this Administration, agencies used a range of social cost of carbon values when evaluating the costs and benefits of rules.

To determine how best to quantify the net benefits from reducing carbon dioxide emissions, the Administration first conducted a preliminary assessment of existing literature in order to set interim social cost of carbon values while it worked on a more comprehensive analysis. Agencies began using these interim values in rulemakings and solicited public comments on the proposed rules in which the values were used. Informed by public comments received on the interim values, the Administration developed and released improved SCC estimates in February 2010 in conjunction with a Department of Energy (DOE) appliance

efficiency- standard rulemaking for small electric motors. Other agencies subsequently used these SCC estimates in their rulemakings.

Since the release of the SCC values in February 2010, numerous rulemakings have used those values for the social cost of carbon. Agencies using the SCC values in rulemakings received extensive public comments, many of which focused on the discount rates chosen and the three peer-reviewed academic models used to develop the SCC estimates.

As explained in the February 2010 Technical Support Document, the SCC methodology rests on three integrated climate change assessment models: the FUND, DICE, and PAGE models. These models combine climate processes, economic growth, and interactions between the climate and the global economy into a single modeling framework. These are by far the most widely cited models that link physical impacts to economic damages for the purposes of estimating the SCC. The SCC estimates rely on a common set of inputs to each model and equally weigh the outputs of the three models, as described in detail in the 2010 technical document.

Recognizing that the underlying climate change impact models would evolve and improve over time as scientific and economic understanding increased, the 2010 SCC documentation committed to regular updates, and set a goal of updating the SCC estimates within two years or after updated versions of the underlying models became available. Since the February 2010 estimates were released, the three models that underpin the interagency social cost of carbon estimates have been all significantly updated and subsequently used in peer-reviewed studies. Many public comments urged the agencies to update the estimates based on the latest models. It is important to note that the only changes made in May 2013 to the SCC estimates reflect the refinements made to the underlying models. In other words, all of the changes to the social cost of carbon values were the result of updates to the FUND, DICE, and PAGE models that were made by the model developers themselves. The Federal Government inputs, such as the discounts rate, population growth, climate sensitivity distribution, and socio-economic trajectories used to develop the 2010 estimates remain unchanged.

As explained in the 2013 Technical Support Document, the updates to FUND, DICE, and PAGE reflect, among other things, improvements in the way economic damages from climate change are modeled. The net result of these updates to the three peer-reviewed models was to increase the SCC estimates. These net changes reflect many specific changes within the three models, some of which increased the estimates and some of which decreased them. For example, for 2015 emissions and using a 3 percent real discount rate, the social cost of carbon value rose from \$24 per metric to \$38 per metric ton (in 2007 dollars). The technical support document provides a range of estimates using different discount rates.

Entities outside of the Federal government are using estimates that are similar to the updated SCC values. For example, these updated estimates are consistent with the SCC values used by other governments, such as the United Kingdom and Germany. Major corporations, such as ExxonMobil and Shell, have also used similar estimates to evaluate capital investments. The Administration will continue to investigate ways to improve the social cost of carbon estimates. The current estimates will be used in the economic analysis of rulemakings, and we

fully expect comments on the SCC values in the context of future rules. We will consider those comments to ensure that we use the best available information to evaluate the costs and benefits of our regulation.

Thank you for your time. I would be happy to answer any questions.

Mr. LANKFORD. We are not going to run the clock, we are going to have conversations. Is that all right with you?

Let me just talk through a couple things. Again, as I mentioned to you before we were talking before the hearing began, several of these things obviously, with your eight days of long experience there in this position, you are not going to know. Cass Sunstein was in front of this committee as well before, so any problems that you have, blame completely on Cass as the previous OIRA director.

But I want to talk through a couple process issues to say how do we determine this and where do we go from here.

Who was the chair of the interagency working group?

Mr. SHELANSKI. The interagency working group was convened by the Office of Management and Budget and the Council of Economic Advisors, with the participation of a couple of Executive Branch agencies and a number of Executive Office of the President Policy Council.

Mr. LANKFORD. Right. I have a list here: the Environmental Protection Agency, Department of Agriculture, Department of Commerce, Department of Energy, Department of Transportation, Department of Treasury, White House Council of Economic Advisors, White House Council on Environmental Quality, White House National Economic Council, White House Office of Energy and Climate Change, White House Office of Management and Budget, and the White House of Science and Technology Policy. Does that sound familiar?

Mr. SHELANSKI. That was the list for 2010. One of the offices was no longer in being by 2013, so the list is almost exactly the same for 2013.

Mr. LANKFORD. Okay, so which one do I need to take off there?

Mr. SHELANSKI. Office of Energy and Climate Change ceased to be a freestanding office and was folded into the Domestic Policy Council by the time of the 2013 updates.

Mr. LANKFORD. So were they present in this meeting or were they just represented by the Council of Environmental Quality?

Mr. SHELANSKI. I would have to go back and check whether they had their own representative.

Mr. LANKFORD. Are there minutes from the meetings? Are there details about the nature of their conversation? Did they take a vote on this process? Any of that that we can get a chance to gather?

Mr. SHELANSKI. My understanding was that this was a consultative sort of integrated process of ongoing discussions that the various offices had. What documentation there might be of those discussions and meetings is something I would have to go back to check.

Mr. LANKFORD. Okay. We would like to get some documentation just to see the path, the reason being is obviously this shows up in a microwave oven rule and appears. It doesn't appear that it had additional comment this time. As you mentioned before, this is an update from the 2010, but it is a 50 percent increase, if I am counting that right, just on the 3 percent discount rate. If you are in the other rates, it is much, much higher.

So it is a fairly significant increase from the 2010, which raises some red flags, the first of which to say if the model is a trustworthy model and in three years it is proved to be wrong by 50 per-

cent, I am not sure we would allow that with CBO, to continue to keep score if we find out three years later their estimates were off by 50 percent. Does that make sense?

Mr. SHELANSKI. Well, let me address that, because I certainly share your concern that one needs to make sure that one is dealing with models that are reliable. These models, at the time that they were identified and used in 2010, it was well understood that these were the best models available, well peer-reviewed, but that they were also models under development and that they would change. So these models are maintained by teams of scientists and economists, independently of the Government.

And the choice in 2010 was really whether not to have a social cost of carbon estimate, not to have the best available science and economics factor into the calculation of some values to attach to CO2 emissions, or to deal with what was best available with the knowledge that as those integrated assessment models were fairly new, were beginning to be developed, that they would change and improve.

Mr. LANKFORD. How were the models selected in 2010? Because you talk about best available. Best available chosen by who, I guess?

Mr. SHELANSKI. Well, the interagency working group looked to see what models were available, and it is important to recognize that what these integrated assessment models do is something that is extremely difficult. There are models that talk about the effects of emissions on climate change and there are models that talk about economic damages under certain assumptions. These integrated models brought together the climate effects and economic effects to turn them into a damages number.

So at the time that the interagency working group convened, virtually all of the literature that was trying to come up with social cost of carbon estimates or that was trying to come up with integrated measures of what damages might be from CO2 emissions were using these three models; they were the most used and most peer-reviewed.

Mr. LANKFORD. Was there a conversation about additional models that may be needed for the 2013? Obviously there was this huge shift between 2010 to 2013. Was there a conversation among the interagency working group to say maybe this is not as reliable as we had hoped, so let's go find some other models that are out there?

Mr. SHELANSKI. I do know that the interagency working group is always assessing the availability of other models and whether or not there are other models that are truly integrated assessment models that have reached the level of scientific verification and quality through the peer review process that the PAGE, DICE, and FUND models have reached. What specific models may have been discussed or when is not something I am aware of at this point.

Mr. LANKFORD. Right. Obviously, you are new in that. So what I would like to do is be able to follow up and try to get some of the notes of what are the models that they looked at, obviously who was there in the decision-making process that they made, any notes that they had during that process of making those decisions, because those will be important for us to see. The cost just shifted

for quite a few things in America based on the new microwave oven rule.

Now, if we can just step back and say with certainty this is really reliable, this is what the cost should be, that is different. But I think this is an opportunity for Americans to be able to look in, as well, and say before my electricity rates go up, before the cost of every vehicle goes up, before my cost of heating oil goes up, and before the cost of all transportation for all my food goes up, I would like to know where this came from and why this actually existed.

So for us it would be very helpful to be able to bring to light who was in part of that process, what was their conversation. That builds trust when you see how did they debate this, what were the decisions that were made, what were the options they looked at, and allow us and outside groups to be able to look at it and say, yes, I completely agree or no, I don't agree.

The difficulty is there didn't seem to be an opportunity to speak into this before it appeared. Do you know if a waiver was requester to not put this in the Federal Register on this particular rule ahead of time?

Mr. SHELANSKI. Well, thank you, Chairman Lankford. That is a very important set of questions. Let me start by saying that the social cost of carbon is not a rule. It is a not a rulemaking.

Mr. LANKFORD. I understand, but it will affect everything that I purchase in the days ahead.

Mr. SHELANSKI. Well, it may or may not. The social cost of carbon will be an input into rulemaking processes.

Mr. LANKFORD. Correct.

Mr. SHELANSKI. And those rulemaking processes, any rulemaking in which the social cost of carbon is used as part of the cost-benefit analysis, will be subject to notice and comment, in many cases to review by OIRA, to ensure that that process is properly undertaken, and there will be an open opportunity for people to comment on all aspects of that rule.

Mr. LANKFORD. Right.

Mr. SHELANSKI. Including the social cost of carbon.

Mr. LANKFORD. But the foundational part of it, once it is settled, this is the foundation, now we are arguing about did it reach the \$100 million threshold to make this a major role, is this significant, is the benefit outweighed by the cost. Whether you are saying that to a power generation company or you are dealing with CAFE standards in the future for a vehicle or you are dealing with transporting fuel for food, all those things, this is the foundational piece.

Mr. SHELANSKI. Well, it is an ingredient. I mean, we should be clear that this is one piece of the cost-benefit analysis. There will be lots of other things that are considered in the costs and benefits of any emissions or energy efficiency standard that would use the social cost of carbon estimate. So SCC will be an input. There are other inputs that could be extraordinarily important in the cost and benefit analysis, but this is an important input into those models, which is why it is extremely important that the public be able to comment on every one of those rules.

Mr. LANKFORD. Right.

Let me get a chance to honor my ranking member, Ms. Speier, for some time for questions as well.



Ms. SPEIER. Let's go to the integrated model, which sounds really good. It sounds like what you did was include not just the social cost, but the economic cost. So if I am understanding you correctly, the economic damage was based on how much more a product would cost or the economic damage was what would happen if there was a Sandy storm?

Mr. SHELANSKI. Thank you, Congresswoman Speier, because I think this gets at the heart of what social cost of carbon is trying to get at. If there is going to be harm to our environment and to our economy from carbon emissions, many costs will go up; the cost of food, the cost of health care, investment that is needed to protect against sea level rise. There are all manner of costs, energy costs, the need for increased energy usage for cooling. All manner of costs may go up for society. That is why it is extremely important to have some kind of measure of what the social costs, by which I mean the costs to society are, of a ton of CO<sub>2</sub> emissions.

So prior to the creation or the development of a social cost of carbon estimate, this was sort of an imponderable. In some cases, you referred to the 9th Circuit case where a value of zero was deemed arbitrary and capricious, a value would just be assumed away. In other cases people called for extremely high values to be used.

Part of a disciplined rulemaking process is using the best information that is out there, the best minds, the best analysis, the best science that is out there to come up with a rigorous cost-benefit analysis. That is a limiting principle on, for example, ascribing endless benefits to carbon reduction. But it also stops us from making a big mistake of saying there are no costs to carbon reduction and creating real harm to our economy going forward from environmental damage. So the purpose of the social cost of carbon estimate is to get a measure of what that harm to our society will be, what it will cost us, going forward, to keep emitting CO<sub>2</sub> into the atmosphere.

Ms. SPEIER. But I am still not clear as to whether or not, in that model, you fold in the additional cost to consumers in terms of the products they buy or to the businesses in terms of the kinds of steps they have to take to reduce their emissions.

Mr. SHELANSKI. Those are all things that would factor very directly into the cost-benefit analysis of any regulation using the SCC number. So you would look separately, after looking at the SCC, that is to say, the benefits of not emitting the CO<sub>2</sub>, we would require the agency or we would expect the agency to give information about the costs to business.

Ms. SPEIER. Okay, so it is not included in the SCC.

Mr. SHELANSKI. Not everything.

Ms. SPEIER. All right. So let me ask you this. You indicated that Exxon and Shell and countries like the UK have come up with an SCC. What have they tabbed it at?

Mr. SHELANSKI. The estimates vary. We know from things that have been stated publicly that Shell uses about \$40 a ton for its internal estimates as the social cost of carbon. Governments like the UK and Germany use numbers very, very close to the 2013 range of social cost of carbon that the interagency working group came up with.

Ms. SPEIER. Like around \$38, is that what you are saying?

Mr. SHELANSKI. You know, there are a range of values, depending on time period and discount rate, but quite commensurate values. I could get back to you on what their exact numbers are.

Ms. SPEIER. So the chairman indicated the issue about tagging this on top of a microwave regulation, and I must tell you I agree with that. We are all about transparency, so why wouldn't this have been, even though it is not a rule, subject to input from the general public and maybe people that are of the belief that carbon has no cost to it, just so that it would be fully digested and evaluated?

Mr. SHELANSKI. So let me answer both the general question about the process by which the interagency group worked and then talk about the microwave oven rule in which this new value first came to light, if you will, in a regulatory process.

The models that underlie the social cost of carbon estimate are not maintained or owned or created by the Federal Government. In fact, they are created by independent scientists and economists. And what is very important about these models, because I think otherwise it would be very hard to use them, is that they are publicly available, the source code and the workings of these models are available on the internet. Anybody can go and see how the models work.

The second thing is that these models are constantly being subject to peer review through the normal scientific process. Journals publish articles that have results and inputs resulting from these models. Those articles are rigorously reviewed and then published and subject to debate and attack. So these are very well-tested models that have been quite publicly aired and that are publicly available.

Now, as for what the Federal Government selected as some of the inputs that would go into the models, things like discount rate, population growth and other socioeconomic variables and those values, those values, first of all, are discussed in great detail in documents made public, the 2010 Technical Support Document and then the 2013 Technical Support Document, just noting, by the way, that nothing changed in those inputs, those Federal Government-selected inputs, from 2010 to 2013.

And those inputs certainly are something that anybody can see, can comment on, can challenge when those inputs and the social cost of carbon are used in a rulemaking. And I would add that the discount rates really are quite consistent with the discount rates that have been aired for quite a number of years through OMB guidance documents like Circular A-4, which go to the agencies and counsel them on discount rates and other inputs into their cost-benefit analysis.

Ms. SPEIER. Is it true that this model changed in part from 2010 to 2013 because of sea level rise?

Mr. SHELANSKI. It is. If one goes back to the 2013 Technical Support Document, which explains, to some degree, what the changes were in the models, and certainly if one goes to the model documentation that is freely available from the developers of those models and online, one of the big changes was a more detailed accounting for and a correction for the effects of sea level rise.

Ms. SPEIER. And was there some dollar amount attributed to sea level rise as part of this social cost?

Mr. SHELANSKI. I cannot answer exactly what the translation was from the modelers' inputs about sea level rise to a dollar value; that is something I would have to go back and ask about. But it certainly is the case that the sea level rise variable did lead to a higher dollar amount, just as other adjustments to the model, I might add, for example, certain adjustments related to short-term agricultural productivity and certain adjustments related to space heating requirements actually had a negative sign in the sense that they actually pushed down on the social cost of carbon estimate. So the inputs worked in different directions but led to, on the whole, a sizeable increase in the estimate of the social cost of carbon.

Ms. SPEIER. I yield back.

Mr. LANKFORD. We are going to be bold enough, since there are three of us talking, that we are just going to leave all mics on and let's just have a conversation. So we will freely interrupt each other and pretend that we are actually going to have a conversation. Is that good with you?

Mr. SHELANSKI. That is fine with me, Mr. Chairman.

Ms. SPEIER. We get lots more questions in that way.

Mr. LANKFORD. Yes, we do. And we will be able to interact more on it.

Ranking Member Speier's question about sea level rise and the revision on that, was that based on the models actually seeing actual rise in sea level or their change in their estimate of sea level rise?

Mr. SHELANSKI. I would have to go back and see which of those it was. It certainly had to do with the scientific literature.

Mr. LANKFORD. Right. I understand. I am just trying to figure out when you talk about sea level rise change and revising a number, I just want to know have they actually seen a rise in the sea level in the last three years, and so we have to update that, or is this a revised estimate of some future time period and when they expect to see a sea level rise and what that amount might be.

I come back to, in college, one of my field experiences in a geology group was to actually go out and do a dig, and I am in central Texas, just outside of Austin, and we went down about three feet and I pulled up shark teeth. Now, I don't know when the last time sharks were in Austin, but it has probably not been recently, and I don't think it was in the industrial age.

So movement of sea is obviously something that has historically happened. Now, I understand there is great debate on whether that is accelerated based on carbon usage or not, but we have had, on North America, a significant amount more water on top of us than what we have right now, so what I am trying to figure on that is are they tracking some significant gain in sea rise that is occurring or are there models out there estimating it. Does that make sense?

Mr. SHELANSKI. I understand the question, Chairman Lankford. I am not prepared to testify on the underlying climate science.

Mr. LANKFORD. Okay. The statement you made about Shell, as well, does Shell actually have a social cost of carbon estimate that you said is \$40 a ton, is that right?

Mr. SHELANSKI. I believe it is \$40 a ton, yes.

Mr. LANKFORD. Okay. Is their estimate of social cost of carbon based on regulations? What are they estimating?

Mr. SHELANSKI. That is an estimate that they use internally when, from what I understand, when they are setting their investment strategy going forward.

Mr. LANKFORD. That is what I am trying to figure out. Are they assuming this is the detriment to the environment at \$40 or are they assuming if we put out a ton of carbon, we are going to have \$40 in regulations come down on us? I am trying to figure out the difference there.

Mr. SHELANSKI. What I think it is, and I want to be clear I can't testify with certainty as to this, so I am giving you my best understanding as I sit here today, but I could go back and check further, is that this is the number they use because they believe it is the number that will factor into regulation going forward.

Mr. LANKFORD. Okay, so that is a regulation number more than it is an assumption that the company makes if we put out a ton of carbon, it will have \$40 worth of damage.

Mr. SHELANSKI. But, to be clear, it is not an estimate of what they think their costs per ton will be for complying with regulation, it is what they believe the number will be that guides regulatory policy going forward. But, again, I really shouldn't say more on that because I need to check.

Mr. LANKFORD. You brought up the discount rate issue as well.

Mr. SHELANSKI. Yes.

Mr. LANKFORD. And said it was fairly consistent. I am not a professional on all the discount rates, but as I pull through several it looks there is a 3 percent and a 7 percent number. The 3 percent number seems to be the one that was landed. And when I looked through this I didn't see the 7 percent as a factor that laid on it. Is there a reason why on that?

Mr. SHELANSKI. Yes. So what discount rates are are basically, particularly when we are talking about long-term effects like climate change, they are measures of how much we value the future; how much we value future consumption, future investment, indeed, the quality of life and the prosperity of our children and grandchildren. That is what we use a discount rate for.

A high discount rate, a discount rate of 7, and I will come back to what that is usually used for, just to be clear about what that would mean, it would mean that we are valuing the prosperity, that is to say, the consumption and well-being, of Americans just 60 years into the future at zero; that we basically would be saying we should not factor into our policy today any well-being of Americans just at the time that my grandchildren, hopefully, will be growing up.

So what a high discount rate does is effectively devalues future consumption, future prosperity.

Mr. LANKFORD. But in the microwave oven rule that is released it has a 3 and a 7 percent, just in that rule, but it doesn't for the social cost of carbon statement.

Mr. SHELANSKI. Right. So these are two very different things.

Mr. LANKFORD. Which is part of our confusion why they were released together, I guess.

Mr. SHELANSKI. Well, I will come back to that in a moment.

The social cost of carbon, we are trying to get a measure of what the cost to society will be over time of a ton of carbon emissions, and we could ask ourselves, well, what would the effect be on the rate of return to private investment, and typically 7 percent is used as a discount rate because it roughly approximates the rate of return to business investment; real estate, small business, corporate investment. We don't use 7 percent when what we are interested in understanding are effects on future consumption by individuals, by consumers, by citizens.

What we are trying to get at with the social cost of carbon is what carbon emissions will mean for the expenditures and the quality of life and the standard of living of every American going forward. So consistent with OMB guidance, we would want to use the 3 percent number, which OMB says what is appropriate for consumption effects rather than investment effects.

Now, that said, just two things. To be sure, 7 percent was not used in the range of numbers given for social cost of carbon because of the belief that it was inappropriate to discount to zero intergenerational effects, effects that would occur one or two generations in the future. And, indeed, that is consistent with the OMB guidance document A-4, which states very clearly that when intergenerational effects are at issue, lower discount rates, perhaps even lower than 3 percent, should be used.

And, in fact, there is an emerging body of thought amongst leading economists that for climate change the 3 percent number is too high and should be declining over time. There is a forthcoming article in Science magazine by a number of the leading economists of the past half century that make this argument.

What the working group did in 2010 and again in 2013 was to provide a range, 2.5, 3 percent, and 5 percent. Now, that 5 percent number is quite a high number if you look at what it implies for future generations, and it also happens to be a blend of considering the consumption effects at 3 percent, or can be thought of, and the investment effects at 7 percent.

So while it is clearly the case that a separate 7 percent number was not listed, and we generally do, where appropriate, ask regulatory agencies to include that in rulemakings, for the purpose of this estimate, which was not a rulemaking, it was an input to rulemakings, the judgment was reached that 7 percent was not appropriate.

Mr. LANKFORD. But the challenge of it is, as far as the input to rulemakings, I know you have said every time it is used there will be opportunity for reply there, but the challenge is that now every time it is used it has to be fought, rather than discussing it the first time. Americans did not have large-scale input on the first time it is used to say is this appropriate, does this line up, can we see the science, can we talk about it, instead of dealing with it the first time and coming to an agreement and revising it, as is normal, where there will be review and comment, there will be letters.

I know you mentioned before that there were letters that encouraged you to update this now that the models had changed; people were writing you or contacting you and saying this needs to be updated. I would be interested to see those letters if they were on

both sides and what the mechanism was for receiving those letters, or if they were just informally people were writing and saying, hey, the models changed, you ought to change this, or was there an open statement to say, hey, the models have changed, should we update this and allow review and comment. But the same on this. That is typical.

If we put out a new rule, if we put out a change, if we put out something that is significant, people have input on it the first time, rather than saying here it is; every time it used, you are going to have to fight it now from here on out.

Ms. SPEIER. And I guess to add to that question, to what extent is the social cost of carbon incorporated in various bids that are put forth or requests for proposals? I am presuming this is all within the Federal Government, right? This would be something we would ask, we would have people fold into their bids relative to various projects that they would be competing for?

Mr. SHELANSKI. I don't know the extent to which the social cost of carbon would factor into our procurement policies or other kinds of bid situations. The main purpose for the interagency working group was so that agencies passing emissions and energy efficiency standards would have some kind of value that they could use in calculating the benefit side of the cost-benefit analysis.

So if we are going to impose a regulation on business, if we were going to ask business to undertake certain kinds of costs or ask the American economy to adjust to a different world in which there were lower carbon emissions, what are we getting in return?

So the purpose of the SCC number was really as an input into the regulatory process. And, Chairman Lankford, to come back to the transparency point, I agree with you completely.

Mr. LANKFORD. It seems odd. It seems like you wouldn't put this in a microwave oven rule, which is a relatively small as SCC; you would put it into a rule dealing with power plant generation or something that is really large and significant to say, okay, we are putting a stake in, this is very significant, we need to debate this rule, let's put it out for comment.

Mr. SHELANSKI. Well, the SCC would be used in any rule that would affect carbon emissions.

Mr. LANKFORD. Right. I understand. But you have to admit in a microwave oven rule I think we are very fairly small SCC footprint on that one.

Mr. SHELANSKI. Well, you know, nonetheless, it is very interesting. I might add, by the way, that the updated social cost of carbon value from 2013 did not drive the standard in that rule; that standard was justified under the 2010 numbers as well.

Mr. LANKFORD. Right. I understand. But it is released in that.

Mr. SHELANSKI. It is released, and what the agency did, in an effort to be transparent and to say, hey, we, out counseled by OMB, as required under the executive orders, are using the best technical, scientific, and economic information that is available. Here is some information that is available. We are going to want our calculations using not just the 2010 numbers, but the 2013 numbers as well, therefore, making it clear here these numbers are now out there and these are going to be used in rulemakings.

And I actually think that when you think about the opportunity to comment on every rule that might use the social cost of carbon estimate, whether it is an energy efficiency rule or an emissions rule, that leads to more ongoing input. I liked your reference in your talk about the synergistic input that comes from people all over this Country. That can happen in every rulemaking procedure.

Mr. LANKFORD. Right. It definitely creates more input, but it creates more input and more activity because you are chasing down 100 issues now, rather than dealing with the first one. It is the difference between if I have a problem with hornets in my backyard, trying to kill each hornet one at a time or actually going to the hornet's nest. If you are settling the issue of what is the social cost of carbon, and it is typical for us as a Nation to say our Government is servant of the people and there is interaction, that synergistic wisdom that we gain from the outside, that there is a sense that we want to have input from everyone at the very beginning.

And if you are going to be affected by this rule, you should have an opportunity to comment on it, at least, and to be a part of this. And I know you keep saying it is not a rule, but it is going to be used all over the place and it will be consistently applied across a wide variety because, as you mentioned before, the SCC now is not different in each agency, it will be unified across all agencies and there will be a multitude of these battles that repeats over and over again, rather than dealing with it the first time, the right way.

Mr. SHELANSKI. So one thing that would have happened, that could happen if you have one big proceeding just to focus on the social cost of carbon is that proceeding happens and that becomes locked in. It then becomes something, you know, you had your opportunity to comment, now we are going to use it until we decide to update it again.

What is great about the fact that this is an input into rulemaking that people can comment on at any rulemaking in which they have an interest is that as new knowledge comes into being, as new science is published, as new models come in, somebody can come in and say, you know, you are using that social cost of carbon value from the 2013 technical support update; that is out of date, we have information that there is a better value you should use.

And you don't have to participate in every rulemaking in order to do that; in any rulemaking, if in just one rulemaking significant information comes to the attention of the regulatory agency and to the Government, that will feed into the ongoing process that was promised in 2010 of revising the social cost of carbon.

Ms. SPEIER. So how about in 2010, how was this kind of previewed? Was it attached to yet another rule?

Mr. SHELANSKI. Well, it was. So there is a little bit of history to what happened. After concern arose about the disparate range or the range of values that was being used by different Government agencies for the social cost of carbon, the administration sat down and said, okay, we need a process for coming up with a more rigorously determined and consistent number.

Ms. SPEIER. Okay, let's back up, then. You just said there was a different range of SCC used throughout the Government. So did SCC start during George W. Bush's administration or was that

when it was first identified because of the court case? How did we first come to use SCC in rulemaking?

Mr. SHELANSKI. Well, I think the concept has been around for a while. My understanding is that the first use by Federal agencies in rulemaking of SCC was in, I believe, 2008. So it was during the Bush Administration.

Mr. LANKFORD. Was that due to a court case or due to an administration decision? Where did that originate? I guess part of her question.

Mr. SHELANSKI. I do know that there was a 2007 court case. I have no knowledge of whether the reasons that agencies, for example, other than the NHTSA used social cost of carbon was because of that court case or because of a policy decision.

Ms. SPEIER. Or does it date back to the Clinton Administration, when cost-benefit analysis was deemed appropriate with any new regulation?

Mr. SHELANSKI. Well, so social cost of carbon I don't think you could tie back to that. It was something that was developed in order to make sure that as regulation aimed at emissions, climate change through emissions control and energy efficiency standards, that the requirement of rigorous cost-benefit analysis, where possible, would be met.

So it certainly was some of the motivation for developing the number comes out of that mandate for cost-benefit analysis, where possible and where legally permissible. A social cost of carbon number specifically, I have no knowledge of whether that was contemplated or considered during the Clinton Administration.

Ms. SPEIER. So in 2008 the first value of an SCC was what?

Mr. SHELANSKI. There were different values used by different agencies. I would have to check to get back to you, but there was no single number.

So when the Obama Administration decided to convene a process to come up with a social cost of carbon number, they first developed interim values that were culled from existing peer-reviewed academic and scientific literature, and came up with interim values that were put out for comment, and while those were put out for comment, and, by the way, agencies use those values and said, look, we are going to use these values and they were part of the comment and the rulemaking procedure, the Obama Administration interagency working group, the Administration group, continued to work on coming up with the 2010 number.

When they did come up with the 2010 number, they released it as part, I believe, of a rule related to the efficiency of small electric motors and received comment on the 2010 number as part of that rulemaking, and then subsequently, and I would have to double-check the exact number, I believe that 18 to 23 rules since that time have used the social cost of carbon. Maybe it is 18 final and 5 proposed rules. I need to go back and check the exact numbers, have used the social cost of carbon number and have received comments on the social cost of carbon analysis.

Ms. SPEIER. So you said 18?

Mr. SHELANSKI. It is 18 to 23.



Ms. SPEIER. Okay. And of how many? What is the universe we are talking about, thousands of rules? You are saying it has been used in 18 to 23 rulemakings.

Mr. SHELANSKI. Rulemakings. Those were individual rules. Those were regulations.

Ms. SPEIER. But there are thousands of rules that are made every day in this Country, right, by agencies?

Mr. SHELANSKI. Right.

Ms. SPEIER. So this is a very small, I guess what I am trying to understand is how large an impact has it had to date. It sounds like it has impacted 18 to 23 rules. Now, some of those rules may be very widespread in their impact.

Mr. LANKFORD. Can you give some examples of some of those rules?

Mr. SHELANSKI. I don't have the list in front of me. I am sorry, Chairman Lankford.

Ms. SPEIER. Maybe you can make the list available to us.

Mr. SHELANSKI. The list is very easy to obtain. I will go back and ask if it is possible to turn that over. But what I would say is, yes, the number of rules may be small in the universe of Federal rule-making. There is no doubt that the social cost of carbon will be used in some very economically significant rules.

Mr. LANKFORD. Right. And that is the concern. You start dealing with power generation, transportation, manufacturing, it gets up in a hurry, as far as increasing or decreasing costs, when regulation can come down and say, no, this is not economically significant because of the social cost of carbon, we decrease this so now it is under 100 million in economic impact. We suddenly get into a whole different debate about this, or to say I am aware that this will cost your company \$1 billion, but we think it will have \$1.1 billion in gain in the social cost of carbon. Now it gets really significant.

Mr. SHELANSKI. So let me address a couple of things. The social cost of carbon number, if used in a benefit calculation to offset a cost calculation, would not be able to be used to evade review of the rule. So let me make that clear. The designation of an economically significant rule focuses on the costs to the U.S. economy, and that rule would still be—

Mr. LANKFORD. Minus benefits.

Mr. SHELANSKI. No.

Mr. LANKFORD. Just cost, period.

Mr. SHELANSKI. When it comes whether a rule is economically significant, we look at whether it will cost the U.S. economy \$100 million a year or more. So that is not a net benefit calculation. It is definitely, and I want to be very clear about this, the social cost of carbon number is not at all to be used to evade review by my office, by OIRA. The cost-benefit analysis in the Federal review process can't be evaded through use of some number that erodes cost. If the costs are there and it is economically significant, it is going to get reviewed.

What the social cost of carbon number does do, as you correctly pointed out, is allow those costs to be put in the context of expected economic benefits to society by monetizing the cost to society of putting an additional ton of CO<sub>2</sub> emissions into the atmosphere.

And one of the reasons it is so critical that this number be updated and that it be correct insofar as science and economics will allow is because we don't want people declaring, well, there is an unlimited benefit to reducing CO2 emissions and then imposing any cost whatsoever on society today because of the regulation. There has to be a meaningful analysis of what those benefits are. So the social cost of carbon number, while some may think it is much too low and others may think it is much too high, does act as a limiting principle on the benefits calculation.

The other thing I might add, just to go back to the ability of people to come back and critique the number and to provide input on whether or not a revision is necessary, it is important to recognize that this number is not by any stretch of the imagination generated by a black box. The number that is in the 2010 document and the number that is in the 2013 Technical Support Document comes from models that are available.

Anybody who has the expertise, and the expertise is fairly widespread, can use these models, can use different assumptions, can see what those models would generate, and could come back and say we wish to challenge these assumptions that underlie the benefits calculation in this particular regulation and show you why you think you got it wrong. That will prompt a serious analysis of that regulation.

Ms. SPEIER. So one of the points you make is that since it is now part of a rule and not part of rulemaking, it can change. But that can be also a thorn in businesses' side if, all of a sudden, this month it is \$38 and next year it is \$58. So there is no certitude to it. Is this somewhat of a fixed number for a period of time, or can this be changed because the model is available and people can make some assumptions and come up with a better determination?

Mr. SHELANSKI. So let me give you two answers to that. One is what is happening out there outside of the Government, in the world of the scientists and the economists who work on this, and the other is what happens inside the Government. The models are always, to my understanding, being adjusted, reviewed, and worked on by the model developers. Now, that doesn't mean that every month they are releasing a new version of the model.

Ms. SPEIER. These are Government employees?

Mr. SHELANSKI. No, these are not Government employees

Ms. SPEIER. Okay.

Mr. SHELANSKI. Absolutely not. These are leading scientists, scholars, people who are in the employ of think tanks, research centers, universities. They are not Government employees. These are independently developed, peer-reviewed models. And they are always working on the models, from my understanding, and periodically they release new versions of the model.

That does not mean that the Government would reconvene the interagency working group every single time there is a new version. I think that, as the 2010 Technical Support Document said, every two years or so it is worth taking a good look and seeing if a revision to the number is warranted.

Now, I will acknowledge that it is a number that can change. On the other hand, there is a choice that the Government faces: to use the changed number that reflects the most up-to-date science and

economics or simply to cover our eyes and say, well, we are going to stick with what we have because, well, it is what we have been using and we don't want to change things.

Ms. SPEIER. So here is a problem, though. The cost of living has gone up. But because we are in sequestration, because we have a debt and a deficit, we have not increased the salaries of Federal employees; they are frozen. In fact, they have been reduced because they are being furloughed. So I don't know if we can be totally purists in dealing with the science of an SCC, just like if you are being a purist, the salaries of Federal employees should have gone up over the last three or four years, and they have been static or declined.

So we have to create some certainty for the business community that is going to be subject to rules that come down the pike from various Federal agencies that will be utilizing the SCC in analysis, correct?

Mr. LANKFORD. Could I add something? I could not agree more. Part of this is the certainty issue.

Ms. SPEIER. About that?

Mr. LANKFORD. About that part, yes, one. That is a big part of this, is that it is done in 2010 and then it shows up in a microwave rule in 2013; it has gone up by 50 percent. There doesn't seem to be any outside communication on it other than just in the future we can take this on a rule at a time. And while you said this was not done in a black box, I don't know the names of the people that were involved in this; I don't know the minutes of it; I don't know the conversation that occurred; I am not aware if they looked at other models; I don't know if there was a conversation to say, gosh, this model changed 50 percent in three years, maybe we should get a different model.

So while you say it wasn't done in a black box because there are these studies that are over here and everyone should have known the studies were changing and of course we are going to change this as well, there wasn't comment from the outside and there wasn't interaction with the United States Congress, House or Senate side. So suddenly, while people are trying to prepare, think, and especially people that deal with energy, those folks have to think 10, 15 years ahead. You don't plan to do a major power plant or an export facility or any other refinery and think, okay, three years from now we are going to do X. That was 10 years ago when they started that process of planning that, and now to know that every three years this could change is a very, very difficult dynamic for them.

Mr. SHELANSKI. Well, you know, I think that if there is evidence that the costs that are being caused by emissions are changing up or down over time, regulation going forward needs to take account of it.

Mr. LANKFORD. Okay, I don't mean to interrupt you on that. You said that kind of thing a couple times. My fear of that is that you have these science-based models that are out here from a group of scientists that agree on this one principle. The principle way is there if you disagree with this rule, then go make your own model. If you go get your own model and get a group of scientists together

that may disagree with this model, create your own model and come compete with the models that we have.

So, you are basically saying to industry these are the models that we are going to use, these are the folks that we like, these are the folks that are doing a model on the social cost of carbon, so to States, to counties, to any kind of business group, whatever it may be, if you want to be in this and play ball, go get a group of scientists, go create your own social cost of carbon model, and then come compete with our models.

Mr. SHELANSKI. So let me respond to that, because that would be worrisome, and it is certainly not the case. I don't know whether we like the people who are developing these models or not. What we like is the fact that these are models that are being developed by groups of people whose work is constantly peer-reviewed, that their results are constantly published; and, very importantly, anybody can dig in and say, you know, there is a problem with the science in this model, there is a problem with the assumptions. These are things that people have the opportunity to inform the Government about.

Mr. LANKFORD. Right. But I would assume in peer review there were some people that pushed back on it as well; they were just, I am going to make up numbers. There were 10 people that peer-reviewed it; 7 of them liked it, 3 of them didn't. So the impression is these three over here that don't like the model, go create your own model and come compete for this one, and then they can also get 10 people to peer-review it and get 7 people that like it and try to compete. You see what I mean? The reason I struggle with this is this is a very difficult number to get your hands on.

So if the sea level rises a half inch 10 years from now, what effect does that have on Naples, Florida? If we have a tenth of a degree of climate change, what will that mean in wheat crops in Kansas? What will that mean to the sea? How much will the sea absorb the heat? How much will it take off the heat? All these are very, very difficult things where there are a lot of assumptions that are built into it.

And, yes, you can get any model that anyone can look at and get any group of peers to be able to say, and publish in different documents, you know what, that is a model; I like part of it, I don't like part of it; write arguments, write journal articles, and it is out. But this gets really difficult to settle when it is moving all the time and it is uncertain, and when the models update, then suddenly it changes our SCC as well.

Mr. SHELANSKI. Chairman Lankford, to respond to your question, I think all I can say is that if we don't have faith in the scientific process of peer review, which is very different from a popularity vote of 3 like it and 7 like it; it involves replication, it involves a much more rigorous process. If we don't have that, then the whole concept of using the best available science, economics, and technical detail is one that would be very difficult to implement anywhere in any kind of regulation.

Mr. LANKFORD. I could not agree more, except in this area, because climate science can't be replicated the same way that you do with other science; it is a lot of guesstimates and modeling and things that you look back on the past and you dig cores and you

examine how much carbon was in the ice. And I guess the process on it, but it is modeling future based on our best guess. So it is not a science that you can go and just replicate and say, okay, we did this, so we can go look at it and five other people can look at it the same way; they are all just looking at a mathematical formulation, and say I agree with your math. But do we agree with the assumptions?

Ms. SPEIER. Except we do that all the time. I mean, pension plans anticipate that we are going to have 7 percent returns and, therefore, on that basis, that is what is going to be taken out of your check and that is what the employer is going to contribute. So we do do that.

Mr. LANKFORD. No, I couldn't agree more, but that is what I am saying, it is not a science at that point, it is a best guess, because it is a forward-looking. I am not trying to denigrate the scientists that are in the middle of it, that is not what I am trying to do, but a lot of what this does is look back in history and then try to look forward on it. That is why it makes it very difficult to be able to process this, which is why I think it needs as much sunshine in the process as possible, which is why we are here today, because it appeared and none of us had input and we don't really know the process, the names of the people that processed the whys, the how, the minutes; it just showed up.

Ms. SPEIER. So what kind of commentary have you received from people since it was attached to the microwave rule?

Mr. SHELANSKI. I would have to go back and look and see what the range of comments were that came in on that particular microwave rule. I can tell you that since social cost of carbon came into being and was attached to the small electric motor rule in 2010 there has been significant comment on social cost of carbon. And one of the reasons for the 2013 update was commentary saying you are using a number that is too low, that is out of date.

And I will tell you that a lot of the criticism of the social cost of carbon number is that it is too low, that it is underestimating the effects, that our discount rates are too high. And the inter-agency working group, the Administration is trying to take, to not have a number seems like a very bad course of action.

Mr. LANKFORD. That is not the debate today, to not have a number.

Mr. SHELANSKI. Right.

Mr. LANKFORD. The debate is the number went up 50 percent in three years. The model was that far off. We are trying to figure out why and how.

Ms. SPEIER. Well, and I think the other part of this discussion is should there be a more kind of open process by which there is a healthy debate or discussion about the social cost of carbon.

Mr. SHELANSKI. So to be clear, though, about the number going up from 2010 to 2013, that had nothing to do with anything that anybody in the Government did.

Mr. LANKFORD. I know, it is our model.

Mr. SHELANSKI. It is the models. The inputs that the Government chose haven't changed.

Mr. LANKFORD. Can you tell me three years from now the model doesn't go up another 50 percent?

Mr. SHELANSKI. I can't tell you what the model is going to do.

Mr. LANKFORD. I know. That is what I am saying. So there is no predictability.

Mr. SHELANSKI. But predictability is certainly not the only value. If the model is based on good science and economics, or the best available science and economics, and does show another 50 percent increase, we think it would be irresponsible not to factor that cost to society of carbon emissions into future rulemakings.

Ms. SPEIER. Well, here is the dilemma, though. If you look at the minimum wage right now in this Country, it is painfully inadequate. But we have not done anything significant to increase it in many years, and the result is that you have to really have two or three jobs if you want to just survive on the minimum wage.

You are saying that we have a responsibility to factor in the social cost of carbon, and I agree with you. But if it were to jump another 50 percent in three years, I think you have to allow policy-makers to evaluate whether or not, at this particular point in time, we can afford to have the SCC go up.

Mr. SHELANSKI. So let me address that. The SCC going up doesn't cost anybody a penny.

Mr. LANKFORD. It is every rule that it is applied to.

Mr. SHELANSKI. It is an input into rules. And those rules will get evaluated on their costs and benefits. And it is an absolute priority of the Obama Administration to make sure that regulation reflects a common sense balance between the needs to protect the health, safety, and welfare of the American people, and the American people yet to come, and prosperity, jobs, economic growth for the current generation. Those things are absolutely at the core of regulatory decision-making in the Obama Administration.

Mr. LANKFORD. Can you tell me what the next administration will do with that?

Mr. SHELANSKI. I cannot tell you what the next administration will do with that.

Mr. LANKFORD. Neither can we. That is the problem. We are setting a path that this changes 50 percent with an uncertainty.

Ms. SPEIER. Well, maybe not.

Mr. SHELANSKI. But what I can tell you is that the next administration will have the same executive orders.

Mr. LANKFORD. Or they could take it straight back, or they could say, no, we will go back 50 percent.

Mr. SHELANSKI. They will have the same executive orders and, I would hope, the same obligation to do rigorous cost-benefit analysis. The concern that we really have to take into account why this is different from the minimum wage is if the social cost of carbon is some certain number out there, and maybe it is much higher than what we have calculated to date or what the models have calculated; maybe it will turn out to go down as more information comes up.

One thing is clear, though. Suppose there is a 50 percent jump in three years and that the best available science and economics says we weren't quite there the last time, we have more information, it is higher than we thought. To turn our backs on that is to say those costs, let's remember what the social cost of carbon is;

it is a measure of the cost to society of emitting a ton of CO2 into the atmosphere.

Mr. LANKFORD. Long-term.

Mr. SHELANSKI. Long-term. What we are willing to say is, you know, we have some current costs and, believe me, those current costs need to be taken very, very seriously. I do not for a minute question their effect or take lightly their effect on current consumers, on current business, on anything. We would be saying we don't care what the costs are for our grandchildren. That would be the statement that, yes, they went up 50 percent.

The best available science and economics, which, by the way, is good science and economics, says that it has gone up 50 percent, but, boy, that is just another big change and that seems problematic, so we are going to impose those costs on future generations and not worry about reducing those carbon emissions. That would be contrary to the best information available to do a current cost-benefit analysis.

Mr. LANKFORD. I have a little bit of an issue with that just for us and our economy, and let me just voice this, and you can see if you want to jump in on this or not. The United States, our carbon emissions have gone down in the last five years. The last seven years, I think it is, even our carbon emissions have gone down. We are switching over to using more natural gas. A lot of things have occurred and our CO2 levels are now down to our 2007 time. I think it is maybe even 2006 time.

So we have watched that occur while it is still rising in other parts of the world. And what happens is we continue to layer on and say, okay, this is occurring, this model is occurring, though we are bringing down our carbon emissions, the United States, it is still going up in other areas of the world, so we anticipate this is going to happen so we hit the American economy one more time with a penalty and it is not happening in other areas.

So China continues to elevate that, continues to win economically, continues to put out more and more carbon is that is the model that is here; we continue to denigrate more and more. This is not a good cycle for us and it is driven based on a rule that, again, I would love for us to agree to know who is in this inter-agency working group and anything about their meetings, to be able to get their notes, the people, the votes, anything about it, because this black box that you say doesn't exist seems to be kind of a black box to us.

Mr. SHELANSKI. Well, just to repeat, social cost of carbon, again, is not a rule.

Mr. LANKFORD. I know, but it is applied to every rule. I get that.

Ms. SPEIER. It is not applied to every rule, though.

Mr. LANKFORD. But it is applied to key rules that will be very impactful on energy and production of food and transportation.

Mr. SHELANSKI. And just to say a word about the global impacts, what we are measuring are the global costs of American carbon emissions. And I don't know, as I sit here today, whether, as we produce less, others are producing more because we are producing less. If we produced more, it would be more carbon emissions, and we are taking account of those costs. It is a global problem, and it seems much easier to exercise global leadership and to get other

countries around world to recognize the social costs of carbon if we are doing so ourselves.

Mr. LANKFORD. I sat down with a quick pen to try to determine, based on this new rule of \$33, if we take the middle range on that, what China puts out and how that affects our economy. It is about \$268 billion, is what I would estimate, based on China's production of carbon for the most recent numbers that I could find. And add to it this \$33 a ton.

So with that, if we were to layer that principle on it, we would say, okay, China, we need to hit them for \$268 billion worth of tariff at some point to make up what they have done to our economy, because they seem to be punishing our economy as they are producing it because it is a global problem.

If we get into that and begin to apply this rule in those areas, now suddenly it is like, okay, India, here we are, we are going to have to apply more tariffs to you because you have this, and it is suddenly this sudden rise. I just have some concerns on how it is going to be used. Obviously you don't set that, but those are issues that we will have to take on in the days ahead. But the number is extremely important to us because it doesn't seem to differentiate where it occurs. So if you have carbon produced in western Oklahoma, where you have relatively few people, or in Los Angeles, there is no difference in that, is that correct?

Mr. SHELANSKI. That is correct, because carbon emissions travel.

Mr. LANKFORD. Right. So we are in the same issue with that. And I don't know if that is where the Administration is headed towards this or what the plan is, to say, China, you produce too much carbon, you produce X amount, we are going to do \$268 billion worth of tariffs on you to make sure that we balance out what you have done to our economy. Or worldwide. It was right at a trillion dollars of total cost to our economy based on the carbon that is in the atmosphere right now produced worldwide. So do we find some way to be able to hit every country in the world to make sure that we get a trillion dollars worth back into our economy for the damage that they have done? Does that make sense?

Again, that is not something that you are going to have to resolve today, but those are issues we have to look at. Those are policy issues, but this is a policy thing that has been set in this black box that we want to be able to allow some conversation into.

Ms. SPEIER. I don't know that I would call it a black box, just for the record.

Mr. LANKFORD. Okay. We don't know who, we don't know when, we don't know how often they meet, we don't know where they meet, we don't have notes of it.

Mr. SHELANSKI. But we do know what.

Mr. LANKFORD. We do know the result as it came out in the microwave rule.

Ms. SPEIER. It is sort of like Wikipedia, you know? People can go in and change things that reflect reality and more people look at it.

Mr. LANKFORD. But the interagency working group, we know the agencies, but do we know who attended the meetings from the agencies?

Mr. SHELANSKI. I have no personal knowledge of that.



Mr. LANKFORD. Again, we are back to we know the agencies, but we don't know who, we don't know how the decisions were made, we don't know how they addressed the science, we don't know if they looked at other models. We don't know and we weren't a part of any of the conversation, but it is going to affect our economy significantly.

Mr. SHELANSKI. But the numbers that they used as inputs they selected and the models they used are ones that are fully available to be challenged.

Mr. LANKFORD. Right.

Ms. SPEIER. And peer-reviewed.

Mr. SHELANSKI. And tested.

Mr. LANKFORD. We get that. So we are back to the same thing: if you don't like it, get your own model and bring it and be a part of the process.

Mr. SHELANSKI. Or pull apart the models that were used, because they are in the Internet, and explain what is wrong with them.

Mr. LANKFORD. Do you know if they looked at other models?

Mr. SHELANSKI. As I said, the interagency working group, my understanding is that they considered all models that could achieve what the interagency working group wanted to achieve, which was the social cost of carbon. There are lots of models that do much more limited things that would not have been relevant.

By some measures, these models are the ones that are used in virtually all, well into the nineties percent of research that is done on social cost of carbon.

Mr. LANKFORD. Do you have additional questions?

Ms. SPEIER. I don't.

But I want to just thank you for taking these rapid-fire questions and handling them so well, and for your participation.

Mr. Chairman, I am going to have to leave.

Mr. LANKFORD. I know, we want to honor your time as well.

This is what all of your hearings will be like from here on out; they will all be just like this.

Mr. SHELANSKI. That would be fine. Thank you.

Mr. LANKFORD. So that would be great. I appreciate your coming. We will have some additional follow-ups. We will try to follow up formally with a letter that I will make sure the ranking member is also aware of as we send it out with just a list of some of the things we talked about today that you obviously don't have in eight days' experience to be there of some of the people to process interagency working group, the functionality of how the decision is made, and then we may even follow up on where the social cost of carbon rule even came up at all. As we discussed before, we are not aware of where it originated, so we can actually find out and get the history of it and bring it up.

Mr. SHELANSKI. Thank you very much, Mr. Chairman.

Mr. LANKFORD. Thank you very much.

With that, this meeting is adjourned.

[Where upon, at 4:00 p.m., the subcommittee was adjourned.]



## **APPENDIX**

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MATERIAL SUBMITTED FOR THE HEARING RECORD

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**Opening Statement**  
**Rep. Jackie Speier, Ranking Member**

**Subcommittee on Energy Policy, Health Care, and Entitlements**  
**Hearing on "Examining the Obama Administration's Social Cost of Carbon Estimates."**

July 18, 2013

Thank you, Chairman Lankford, for holding today's hearing, and thank you to Mr. Shelanski for being here.

Americans are feeling the impacts of climate change from destructive and deadly storms like Hurricane Sandy, floods, droughts, and some of the largest wild fires in history. Cleaning up after climate-driven disasters cost nearly \$100 billion last year, one of our largest non-defense discretionary budget items. That works out to an average of over \$1,100 per taxpayer. It is clear we not only have a moral obligation to protect future generations from climate change, we must do it for sound economic reasons.

Despite what some may say, there is sound science behind the impact of carbon in climate change.

According to the National Academy of Sciences in 2011, "climate change is occurring, is caused largely by human activities, and poses significant risks for a broad range of human and natural systems," and "The preponderance of the evidence points to human activities as the most likely cause for most of the global warming that has occurred over the last 50 years...."

This year, the nonpartisan experts at GAO added the issue of climate change to their biannual High Risk report, which details the most pressing fiscal challenges facing the federal government. GAO found that climate change poses particularly significant financial risks to the nation's economy, warned that our government "is not well positioned to address this fiscal exposure," and recommended a "government-wide strategic approach with strong leadership and the authority to manage climate change risks."

Laura D'Andrea Tyson, of the Haas School of Business at U.C. Berkeley and a former chairwoman of the Council of Economic Advisers under President Clinton, wrote in *The New York Times* in May: "There's much debate about what the proper "social cost of carbon" might be, but there is no debate that carbon emissions are seriously underpriced."

Today's hearing examines part of the Obama Administration's effort to listen to the best available science to create a monetary estimate of the cost of CO2 emissions and incorporate that scientific knowledge into a government-wide approach to manage climate change risks, as GAO recommended we do.

Prior to 2008, reductions in CO2 emissions were not valued at all in federal cost benefit analyses. The process of establishing a social cost for carbon was actually begun in the Bush Administration after the 9<sup>th</sup> Circuit court in a challenge to a regulation chastised the National Highway Traffic Safety Administration in 2007 for assigning a social cost of carbon of \$0 in setting fuel economy standards. The court noted that NHTSA's failure to account for carbon contrasted starkly with its willingness to quantify equally indeterminate costs and benefits, like traffic noise and energy security. The court declared the rulemaking arbitrary and capricious.

In 2010, an interagency panel consisting of prominent scientists and economists from the Departments of Agriculture, Commerce, Defense, Environmental Protection Agency among others developed the first estimate of the social cost of carbon. In May 2013, that figure was updated, and not surprisingly the cost estimate rose.

The interagency working group explained the reason for the increase: that is what the best available science now tells us.

In listening to the best available science, the interagency working group was simply complying with the law, which states, quoting from Executive Order 12866 (1993), Federal agencies shall:

assess both the costs and benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs, and base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

There are those who criticize the way the estimate was calculated. Of course, there is room for disagreement with any process, but for those that do, I challenge them to bring their own suggestions on how to improve the process. What I would not agree with, are those critics who advocate that we make NO estimate. That would be a colossal mistake for any of us in a position of responsibility to make.

If we fail to adequately prepare for climatic changes, billions of dollars in federal, state, and local investments in public infrastructure will be threatened. I am proud that California has been a leader in reducing CO2 emissions. In fact while in the State Senate I voted for AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal. That bill was signed into law by Republican Governor Arnold Schwarzenegger.

One state cannot do it alone. We have an obligation to plan for and prevent those threats on a national level and to set an example for all states and local governments. Failing to quantify the cost of carbon emission is tantamount to doing nothing in the face of an approaching tidal

wave.

I thank the Chairman for looking at this extremely important issue because if we cannot assess the economic extent of the damage caused by carbon pollution, we will never be in a position to deal with the very real effects of climate change.

I look forward to the testimony of our witness and I thank you in advance for your participation in this matter.

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Contact: Jennifer Hoffman, Communications Director, (202) 226-5181.

