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DISCUSSION DRAFT ADDRESSING ENERGY RELIABILITY AND SECURITY

TUESDAY, MAY 19, 2015

House of Representatives,

Subcommittee on Energy and Power

Committee on Energy and Commerce

Washington, D.C.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2123 of the Rayburn House Office Building, Hon. Ed Whitfield [Chairman of the Subcommittee] presiding.

Members present: Representatives Whitfield, Olson, Barton, Shimkus, Pitts, Latta, Harper, McKinley, Kinzinger, Griffith, Johnson, Long, Ellmers, Flores, Mullin, Hudson, Upton (ex officio), Rush, McNerney, Tonko, Engel, Green,

Doyle, Sarbanes, and Loebsack.

Staff present: Nick Abraham, Legislative Associate, Energy and Power; Gary Andres, Staff Director; Charlotte Baker, Deputy Communications Director; Will Batson, Legislative Clerk; Allison Busbee, Policy Coordinator, Energy and Power; Patrick Currier, Counsel, Energy and Power; Tom Hassenboehler, Chief Counsel, Energy and Power; A. T. Johnson, Senior Policy Advisor, Energy and Power; Michael Goo, Democratic Chief Counsel, Energy and Environment; Caitlin Haberman, Democratic Professional Staff Member; and Rick Kessler, Democratic Senior Advisor and Staff Director, Energy and Environment.

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Mr. {Whitfield.} It is 10 o'clock, and so I would like to call this hearing to order.

Today, we are going to continue our discussion on our discussion draft, and the subject matter today is energy reliability and security. And we are going to have 2 panels of witnesses, and I will get to the specific introduction of the panels in just a moment, but at this time, I would like to recognize myself for a 5-minute opening statement.

And the American people, throughout its history, have had a goal of having affordable, abundant, and reliable electricity, and we have been pretty successful at that. And today, we have an abundance of fuel. Unfortunately, electricity rates are continuing to go up, and electric reliability faces a number of challenges, both new and old. The rapid retirement of coal-fired generation due in part to aggressive EPA regulations means that this reliable source of base load generation is being lost at a rate that is faster than it can be replaced. At the same time, mandates and incentives for renewable power have led to growth in sources like wind, but these energy sources pose great intermittency

issues. And, as we learned at last week's hearing, hydropower and natural gas face significant permitting hurdles. Altogether, the Nation's electric grid, though still the best in the world, is aging and in need of extensive modernization.

The security of our electricity supply is also at risk. No one seriously doubts that there are those who wish to do America harm, and that includes the threat of physical or cyberattacks on our electricity system.

At our March hearing on 21st century electricity, we learned that as the grid becomes more reliant on information technology and digital communications devices, thousands of new grid access points are created, potentially increasing the avenues for outside attacks. And while these new threats need to be addressed, we can't forget about the old ones such as damage from severe weather, especially now that the ability of utilities to respond to emergencies is complicated by the growing list of environmental regulations. But where there is challenge there is also opportunity. Over the next decade alone, utilities plan to invest more than $60 billion in transmission infrastructure through 2024 to modernize the

grid. That is a lot of private sector jobs. And the application of the information revolution to the electric grid holds the potential for more efficient and cost-effective delivery and use of power, which will help homeowners as well as businesses. And we must not forget that we are in a global marketplace, and we are competing with nations around the world to produce jobs.

This discussion draft contains a number of measures to strengthen reliability and security and prepare the grid for the future. This includes provisions to resolve potential conflicts between grid reliability and environmental regulations, and to improve emergency preparedness and response. It requires a Department of Energy plan regarding the creation of a Strategic Transformer Reserve, and also establishes a volunteer program to harden the grid against cyber-security threats. Other measures encourage state public utility commission and utilities to improve grid resilience and promote investments in energy analytics technology to increase efficiencies and lower the cost for ratepayers, while strengthening reliability and security. The discussion draft also requires FERC to work with each RTO

to encourage a diverse generation portfolio, long-term reliability and price certainty for customers, and enhanced performance assurance during peak periods.

So we are really excited about this discussion draft, and our opportunity to pass this legislation to improve the conditions of our electricity in America.

[The prepared statement of Mr. Whitfield follows:]

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Mr. {Whitfield.} And I will yield back the balance of my time, and I recognize the gentleman from California, Mr. McNerney, for a 5-minute opening statement.

Mr. {McNerney.} Thank you, Mr. Chairman. I just wanted to let the subcommittee know that the ranking member's plane has been delayed, so he will be here later this morning.

I had a chance to review the discussion draft. I think there are some very good provisions in it. We clearly need to look at our electrical infrastructure, our security, the reliability of it, can we meet the demands of the 21st century. And there is a lot of good opportunity and technology out there to help us get there, and we want to make sure that we put the right incentives in place, and that we give a roadmap that makes sense.

One or two of the provisions in--one or two of the sections I think are problematic; we need to discuss those in some detail, but by and large, the proposed bill looks favorable. And I am going to work with the ranking member to make sure that we have something that we can all agree on.

So with that, I am going to yield back. Anyone else on

our side needs to--would like to--I would like to recognize the gentleman from Texas.

[The prepared statement of Mr. McNerney follows:]

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Mr. {Green.} Thank you, Mr. Chairman, and I will use all my 5 minutes for questions.

But Section 1201 resolves an issue in the federal law between reliability and environmental protection, and that is one of the issues that we have worked on on a bipartisan basis. I am pleased that it includes issues that both my good friends, Congressman Pete Olson and Mike Doyle, and I have worked on, and the legislation resolves conflicts in federal law that puts reliability and environmental protections at odds with each other. And I have said many times, the choice doesn't have to be either or or; it can be both, but--and we demonstrate it in this language.

And with that, I appreciate the chair including that, and I will have some questions when I get my 5 minutes.

Thank you, and I will yield back.

[The prepared statement of Mr. Green follows:]

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Mr. {McNerney.} Mr. Chairman, I yield back the remainder of my time.

Mr. {Whitfield.} Thank you very much.

Is there anyone else on our side that would like to make a statement? Okay.

When Mr. Rush comes in we will give him an opportunity to make a statement at that time, if he has one.

So now we can proceed to our first panel. We are delighted to have on our first panel Mr. Michael Bardee, who is the Director of the Office of Electric Reliability over at FERC. And, Mr. Bardee, thanks very much for being with us today. We also have Mr. Gerry Cauley, who is the President and CEO of the North American Electric Reliability Corporation. Thank both of you gentlemen for being with us. We appreciate your expertise, and we look forward to your comments on this discussion draft, and look forward to working with you as we move forward.

So, Mr. Bardee, I will recognize you for a 5-minute opening statement.

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^STATEMENTS OF MICHAEL BARDEE, DIRECTOR, OFFICE OF ELECTRIC RELIABILITY, FEDERAL ENERGY AND REGULATORY COMMISSION; AND GERRY W. CAULEY, PRESIDENT AND CEO, NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

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^STATEMENT OF MICHAEL BARDEE

} Mr. {Bardee.} Thank you, Chairman Whitfield, and members of the subcommittee. Thank you for inviting me to appear before you today. I am here today as a commission staff witness, and my remarks do not necessarily represent the views of the commission or any individual commissioner.

Section 1201 of the discussion draft seeks to resolve conflicts between the requirements of Federal Power Act Section 202(c) and environmental laws. I support the concept in Section 1201. Operating a power plant in compliance with Section 202(c) should not cause a violation of environmental laws.

Section 1202 of the discussion draft would require the commission, in coordination with NERC, to perform reliability

analyses of major rules proposed or issued by other federal agencies if they may impact an electric generating unit, and have an annual effect on the economy of $1 billion or more. The number and type of rules that might be subject to this section is unclear; thus, it is difficult for me to foresee the ramifications of this section. Also, the commission has the expertise to evaluate these type of analyses, but generally has not maintained the tools and data to perform such analyses itself on the proposed timelines. If Congress gives the commission this responsibility, Section 1202 should be clarified so that planning authorities must timely conduct and provide the analyses and information requested by the commission. In this way, Section 1202 would rely primarily on their existing processes for identifying and addressing reliability issues, while allowing the commission to ensure consistent, objective analyses of these rules.

Section 1204 of the discussion draft would allow the Department of Energy, in certain circumstances, to require actions to address grid security emergencies. The commission has approved standards for cybersecurity, physical security, and geomagnetic disturbances. Last week, the commission

proposed to approve, but required changes to, an additional standard for GMD events. Section 1204 would address concerns that the current processes for developing standards are too slow, too open, and too unpredictable for emergencies. But while Section 1204 authorizes requirements to protect against imminent danger, it should be clarified to also address restoration of grid reliability after an unforeseen attack or event.

Section 1208 would require the commission to direct each RTO and ISO with the capacity market or comparable market to demonstrate how it meets certain requirements. The requirements include integrated system planning practices, such as having a diverse generation portfolio and stable pricing for customers. In general, the commission prefers to rely on competitive forces when reasonable, but recognizes that traditional regulatory approaches are sometimes needed in wholesale electricity markets. Section 1208 takes a different approach and would impose on RTO and ISO capacity markets a broad overlay of traditional regulatory requirements. This approach may reduce the potential for these markets to provide consumers with the benefits

achievable through competitive forces, and may cause unnecessary conflicts between federal and state regulatory efforts. It would be preferable to not codify such an approach, and instead, allow the commission to adapt market rules over time with the goal of maximizing competitive forces.

In conclusion, thank you again for inviting me to testify today. I would be happy to answer any questions you may have.

[The prepared statement of Mr. Bardee follows:]

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Mr. {Whitfield.} Thank you very much.

Mr. Cauley, you are recognized for 5 minutes.

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^STATEMENT OF GERRY W. CAULEY

} Mr. {Cauley.} Thank you, Chairman Whitfield, and good morning to the members of the committee.

I am very pleased to be here today to testify concerning the energy reliability and security discussion draft. My name is Gerry Cauley, and I am the President and CEO of the North American Electric Reliability Corporation. I have dedicated the last 35 years of my career to the reliability and security of the power grid, and at this point, I can say there has never been a time where I have been more concerned about reliability and security than today.

The threat of cyber and physical attacks on the grid by nation-staged terrorist groups and criminal actors is at an all-time high. I believe the first line of defense in securing the grid is robust information-sharing regarding threats and vulnerabilities. Any one entity, public or private, cannot see a complete picture of all security threats and activities. Unfettered sharing of information among entities responsible for protecting the grid, both

industry and government, helps us better understand how to protect the grid. However, sensitive grid security information must be effectively safeguarded from public disclosure that could allow information to fall into our adversaries' hands.

I am also concerned about potential future risk to reliability and adequacy of power supplies that might be introduced by government regulations and rules that cause a dramatic transformation in how we produce electricity for our customers. As suggested in the draft, such rules should be subject to rigorous electrical and market analysis to avoid unnecessary risks to future reliability and adequacy of electricity supply. As noted in a recent NERC report, it can take many years to build transmission lines and gas infrastructure to safely accommodate a large transformation of our power generation supply.

I also appreciate the recognition in the draft language regarding the role of the Nation's Electric Reliability Organization. As the ERO, NERC assures the reliability of power system through mandatory standards, rigorous compliance monitoring and enforcement, and reliability assessments. We

also operate the Electricity Sector Information Sharing and Analysis Center, and conduct continent-wide security exercises. NERC appreciates the recognition in the draft language of the ERO's important role in security and reliability assessments.

In the remainder of my time, I would like to touch on a few specific points within the draft language with regard to Section 1202 on reliability analysis of major rules. NERC has been conducting grid reliability assessments for 45 years, and we are expert at it. We perform annual long-term assessments, as well as assessments of emerging issues, such as impacts of environmental regulations, integration of renewable resources, interdependencies with natural gas, and geomagnetic disturbances. The bill's reliability analysis section identifies a role for FERC in coordination with the ERO to conduct an independent reliability analysis and propose new rules. And we have three comments on this section. Essentially, we support the proposal. NERC would be pleased to work with FERC on reliability analysis of proposed new rules that propose potential challenges to resources adequacy or reliability.

And agreeing with my colleague's comments, second point, the language triggering a reliability review for any major rule that may impact even a single electric generating unit could sweep in a larger than necessary number of reviews. And we would suggest broader criteria focusing only on the most important significant proposed rules would be more practical.

And finally, we would be more--we think it would be helpful to have a bit more time than the 90-day and 120-day proposals for the analysis.

Referring to Section 1204 on grid security, with regard to emergency authority language, NERC is supportive of legislation clarifying Federal Government authority during grid emergencies. Specifically, we appreciate being part of the DOE consultation process when considering emergency orders that is contemplated in the draft. With regard to information-sharing, NERC supports the intent of the draft language to promote robust sharing of security information, and the safeguarding of sensitive information. However, a significant amount of information-sharing already exists, and should be allowed to continue. Our cybersecurity standards

require reporting of certain cyber threats and incidents. Our ES-ISAC provides a venue for sharing a voluntary cyber and physical security information across the entire electricity sector. It is important to provide key protection sought by the draft for critical electric infrastructure information, including federal and state FOIA exemptions, the language proposing FERC regulations governing and handling nondisclosure of CEII could be helpful.

Finally, the draft does not address incentives and protections for sharing of critical cyber and physical security threats and vulnerabilities that are outside the bounds of CEII.

I look forward to your questions. Thank you.

[The prepared statement of Mr. Cauley follows:]

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Mr. {Whitfield.} Thanks, Mr. Cauley. We appreciate the testimony of both of you.

And at this time, I recognize myself for 5 minutes of questions.

I think all of us acknowledge that the electricity industry today faces a great deal of uncertainty, and the decisions that this Congress makes with bills like what we are trying to put together at this time are going to have a great impact going forward in the future. And I hope that we can make the right decision because the American people deserve it, and we want to be competitive in the global marketplace. And one of the real frustrating things for me personally has been how aggressive EPA has been, and they are focused on a clean environment, which is vitally important, but one of the areas that has bothered me and many others is that EPA seems to have been trying to take a lead in making a decision that reliability is not going to be affected in a meaningful way by any of these regulations. And we know that EPA has been more prolific in this Administration than any time in recent memory, and those regulations are going to

have a dramatic impact. And that is why we see so many lawsuits being filed, we are not sure what final rules are going to be coming out, so we have a lot of uncertainty.

But Section 1202 is designed to help address this reliability issue. And I was reading a statement just this morning from one of our witnesses, and he said that 1202, that this provision is unnecessary because FERC jurisdictional grid regions already are required to assess the impacts of environmental standards on grid operations.

So I would ask you two gentlemen if you would respond to that. I mean do you see some real advantage in having our Section 1202, or do you believe that maybe this witness is correct?

Mr. {Bardee.} Chairman Whitfield, I would say that there is a fair amount of work done by the industry on these types of issues now through entities like NERC, through its regional entities, through the utilities. Whether Section 1202 is necessary or not I would leave to Congress, but if Congress feels like the commission should have the responsibility in that section, I would just want to make sure that we could do it in a reasonable time frame, and do

it well. And I think it is important that those perspectives of what will be the impacts on reliability should be fully considered, and the ramifications explored before any final rule is issued.

Mr. {Whitfield.} And, Mr. Cauley, of course, you all have the responsibility on reliability, and we all appreciate everything that you are doing, but would you comment on my question?

Mr. {Cauley.} Sure, Mr. Chairman. I would support the inclusion of that section in the final legislation. We do assessments all the time, and we have done them on environmental issues, we have done them on solar magnetic disturbances, essential reliability services, introduction of renewables, and most of the time these early warnings and assessments of issues coming up can be addressed. The industry is flexible, they can adapt, they can make investments and change. But I think we have seen sometimes the proposed change is too dramatic, and I think that is what I see in limited use, in limited cases, that that section would provide a backstop in the event that the proposed nonelectric rules were going to drive us into an untenable

spot in terms of reliability risk, whether it is resource availability or it is electric and gas infrastructure to support keeping the grid reliable several years down the road.

So I think as a backstop on extreme cases, it is necessary.

Mr. {Whitfield.} Okay. And would you just briefly summarize the conclusion of NERC's recent Phase I report?

Mr. {Cauley.} We published a report just in April, the second report on the 111(d) proposed rule, and we concluded that there would be a continued acceleration of retirement of coal units, and a dramatic shift of coal units from being base-loaded to being essentially peaking rarely used units. It is questionable about whether the economics would support them staying around under that little bit of use, and it--we think there might be incentives to retire them even further.

The shift to 70 percent or more of dependence on gas, we will--what we need to ensure is that there is adequate gas supply. Gas is a just-in-time fuel, and we need to make sure there is sufficient pipeline capacity and storage capacity to meet the coldest days and the peak load systems, that the

energy is going to be there for electricity.

We also are concerned about maintaining a base of electric services, essential reliability services. Large rotating machines provide these electrical characteristics, inherently stability, inertia, voltage and frequency control. So we need to make sure that the policies are in place to make sure that they are still there.

So a number of other recommendations and suggestions, but we are concerned about the timing of the early portions of the targets that were proposed by EPA.

Mr. {Whitfield.} Thank you very much. My time has expired.

At this time, recognize the gentleman from California, Mr. McNerney.

Mr. {McNerney.} Thank you, Mr. Chair.

First, Mr. Cauley, on the Section 1206, which is--I am one of the coauthors on cyber sense, do you have other recommendations how to improve cybersecurity of our electric network?

Mr. {Cauley.} Well, I think the proposal in 1206 is--can be helpful. One of the challenges we have is we have a

global supply chain in our grid. So to have a process where vendors are vetted and equipment is vetted, and we can share that information, I think is very helpful. So I support that proposal.

I think the biggest issue for me is ensuring that the asset owners in the grid feel that they can share threat and vulnerability information; stuff that they are seeing on their systems, share it without threat of liability and without threat of compliance sanctions, when really, they are just trying to help us put together a bigger piece of the puzzle about what is happening. I think that is really essential.

Mr. {McNerney.} So that might be a way to strengthen that section then?

Mr. {Cauley.} Yes.

Mr. {McNerney.} Thank you.

Mr. Chairman, one of the--the section I think that is going to give us the most controversy is Section 1202.

And I have a couple of questions, Mr. Bardee, about that. Do you feel that Section 1202 will require FERC to interfere with state jurisdictions?

Mr. {Bardee.} You know, I don't know that Section 1202 would cause us to interfere with state authorities and responsibility, and certainly, it would be our goal not to do so. If we were given that responsibility, I would see it as more trying to objectively assess the possible future impacts of a proposed rule, and then it would be a matter for the initiating agency to consider that input from us and others in deciding on a final rule, hopefully in a way that would not overstep interstate rules.

Mr. {McNerney.} Well, do you feel that FERC and the DOE are already coordinating adequately with rule-generating organizations?

Mr. {Bardee.} Excuse me, with who?

Mr. {McNerney.} With rule--with agencies that generate the rules.

Mr. {Bardee.} We certainly have been engaging with EPA, DOE, and the commission. Their staff have been meeting with EPA periodically as the Clean Power Plan has been developed, even before it was formally proposed. And my expectation is that that will continue so that EPA understands the perspectives that commission staff and DOE staff can offer to

assist them in their decision-making.

Mr. {McNerney.} Do you think that if Section 1202 is enacted, that it would enhance that cooperation, or would it change it, or would it make it worse?

Mr. {Bardee.} I certainly don't think it would make it worse. I think it is hard to say whether it would make a significant difference in the amount of engagement between the agencies. I think the most important matter is that entities with that kind of a planning role continue to perform the work they have already, such as NERC, such as PJM, such as WEC, because they have the best tools and information to provide that input.

Mr. {McNerney.} One of the other issues is the 90 days and 120 days. The 90 days for a proposal, and 120 from the actual rule. Do you think FERC has the resources to be able to respond, say, to the Clean Power Plan or the Mercury Air Toxic Standards, within that time frame--within those time frames?

Mr. {Bardee.} I think it would be very difficult to meet a 90-day deadline on a proposed rule. Just to give a couple of examples, when EPA issued its proposed Clean Power

Plan, PJM and MISO and ERCOT did not issue their analyses until November, which was about 5 months after the proposal came out. I don't know how long NERC's work took, Mr. Cauley could address it, but I think it was in the range of about 5 to 6 months. And whether that can be squeezed into a tighter time, maybe that is possible, but 3 months would be very challenging.

Mr. {McNerney.} Mr. Cauley, do you want to follow up with that?

Mr. {Cauley.} Well, we did publish our initial report in October. So from June to October. It does take--4 to 5 months is an extreme case. We have to collect a lot of data on individual generators and load forecasts across all regions that we look at, so it is a very data-intensive, very detailed analytic process. So 90 days or 120 days both are very short for that kind of analysis.

Mr. {McNerney.} Okay, so an improvement in the bill might be to give, say, 6 months or something of that order then?

Mr. {Cauley.} That is correct.

Mr. {McNerney.} All right, thank you.

I yield back.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Texas for 5 minutes, Mr. Barton.

Mr. {Barton.} Thank you, Mr. Chairman.

I want to ask Mr. Bardee, is it a true statement that electricity markets are regional rather than national?

Mr. {Bardee.} I think it would be fair to say that the electricity markets are regional. There is some trading across regional boundaries, but primarily the markets are regional, in my view.

Mr. {Barton.} Okay. I would--Mr. Cauley, do you agree with that?

Mr. {Cauley.} Yes, sir.

Mr. {Barton.} Okay. If that is the case, as we are coming up with these--this national bill, do we have the responsibility to allow for regional differences in these standards and requirements?

Mr. {Bardee.} I think the way I would describe the Clean Power Plan is it is a state centric proposal. There certainly have been a number of studies that have indicated

significant benefits achievable from regional compliance efforts, economic benefits and reliability benefits, and I would hope that there is a way for the states to achieve some of those benefits, but right now, the proposal is state-based.

Mr. {Barton.} Okay. Well, here is my point I am trying to get at. Texas is an anomaly because of ERCOT. Two-thirds of our power generation and our consumption is intrastate, within the state, and is controlled by the state. It has to comply with FERC regulations, but it is independent. About 1/3, we have transmission lines that cross state boundaries in the west and in the east, but for all intents and purposes, the bulk of the electricity market in Texas is an intrastate market. That is not the case in other states. They are almost, I think, all interstate markets, but in the Midwest and the Northeast, I believe I am correct that their demand curve is flat or declining. Is that correct?

Mr. {Bardee.} I am not sure, sir, but I certainly am aware that load growth has not been as significant as it had been in the past. The--

Mr. {Barton.} Well--

Mr. {Bardee.} --rate of increase has declined, certainly.

Mr. {Barton.} The--you know, if you have to maintain a reliability criteria and protect against cyber threats in a market that is stable, and the demand is either stable or declining, that is one thing, if you are in a market, I would say Florida, Texas, maybe California, I am not sure, Arizona, where there still is robust demand increase, that is an entirely different thing. Much different. And, in my opinion, we need to allow for those differences at the legislative level, but also at the regulatory level at FERC, and it is something that I haven't seen a lot of commentary on. We just assume that the electricity market in the United States is one big market and it is all the same. That is not true. That is not true. It is totally different, and as we move forward with this legislative proposal, we need to allow for that. If we get it right at the legislative level, then there is at least some chance that we can get it right at the regulatory level too. And that is the main point that I wanted to make, Mr. Chairman, that this is--this--we need to look at it from a regional basis, and make some allowances to

give the state regulatory agencies and the FERC with their partners at the North American Electric Reliability Corporation the ability to show some flexibility.

And I am going to yield back the balance of my time.

Mr. {Whitfield.} Yeah. Well, thank you. I mean you make a--definitely a good point because we don't have a national market, we do have a very balkanized system, appreciate your comments.

At this time recognize the gentleman from New York, Mr. Tonko, for 5 minutes.

Mr. {Tonko.} Thank you, Mr. Chair.

You state in your testimony, Mr. Bardee, that the Federal Power Act, Section 215, is inadequate for emergency action, and that the procedures outlined in this section, and I quote, ``do not provide an effective and timely means of addressing urgent cyber or other national security risks to the bulk power system.'' Is this primarily related to the issue of deliberative open processes for reliability standards development, or are you thinking of other barriers to effect and timely action as well?

Mr. {Bardee.} What I was trying to describe was the

current process which is open and very deliberative, and that can be a strength in the normal context of developing standards for traditional engineering concerns in the electric field. But in the context of cyber threats or physical threats that we may face, it is difficult to envision that process working that quickly. Now, this past year, we directed NERC to provide a standard on physical security within 90 days, to send us a proposal within 90 days, and they well met that deadline, but even so, it is not clear that you could have that process work as quickly as you might need it in an emergency.

Mr. {Tonko.} Thank you for the clarification.

And, Mr. Bardee, again, I am concerned that the language in Section 1208 of the discussion draft places too many constraints on RTOs and ISOs and their choice of resources they might use to ensure grid reliability. Now, this section is not very forward-looking. It appears to equate base load power capability with reliability. We in New York and in the Northeast learned through the experience with Hurricane Sandy that systems like combined local or heat and power and micro grids provided power for some customers even when the grid

went down. So as you know, new technologies are being added to the grid in greater efficiency, demand response programs, and renewable generation are all transforming the grid in very rapid fashion.

Now, it appears that this section would constrain the development of these new grid resources, and FERC's ability to integrate them into competitive markets. Might that be a concern?

Mr. {Bardee.} Our concern with Section 1208 is that it could be construed as requiring us to set rules and impose standards that could chill market participants from the choices they might otherwise make of their own free will.

Now, we understand that sometimes in capacity markets you do have to have certain boundaries to elicit a reasonable supply at adequate prices, but we think Section 1208 raises an undue risk of constraining the choices of market participants.

Mr. {Tonko.} So would it have impacted perhaps the outcome that was evident in greater New York with the impact of Hurricane Sandy?

Mr. {Bardee.} I couldn't say for sure. I would say

that depending on how something like a diverse generation portfolio is defined, what are the components of it and what are the percentages of it, it could be applied in a manner that would limit perhaps the development of distributed generation resources.

Mr. {Tonko.} And I would ask either of you, if the Strategic Transformer Reserve Plan had been in place, how many times might it have supplied equipment and response to an emergency over the past 5 or--5 to 10 years?

Mr. {Cauley.} My belief is it would not have been instituted. There was a significant amount of transformer capability at individual companies. We also have a database for sharing transformers that can be swapped in emergencies. So at this point, with the number of transformer events, typically in the one or two levels, would never have kicked into the strategic level.

Mr. {Tonko.} Um-hum. And would it have helped in the cases of Hurricanes Katrina or Sandy, for example?

Mr. {Cauley.} The large equipment, transformers in particular, were really not affected by the storms. The storm outages were predominantly trees and distribution, and

local poles and lines, and not the heavy equipment inside of a substation.

Mr. {Tonko.} And I assume there would be costs associated with setting up and operating this transformer reserve program?

Mr. {Cauley.} There would be costs, and I don't want to--just because it hasn't happened, we have large-scale cyberattacks, physical attacks, GMD. I understand the risk that it is trying to address, I just think it needs to be very carefully managed, what we are trying to achieve. It is a last resort backstop and cost needs to be a consideration.

Mr. {Tonko.} And, Mr. Barbee, any--Bardee, anything?

Mr. {Bardee.} I think it is important to ensure that we have an adequate supply of spare transformers and other equipment. This could be a useful tool for achieving that goal. It depends on the extent of efforts industry is making and will make in the future, but I think it could be a good tool for ensuring we get there.

Mr. {Tonko.} I see my time has expired, so I will yield back, Mr. Chair.

Mr. {Whitfield.} At this time, recognize the gentleman

from Texas, Mr. Olson, for 5 minutes.

Mr. {Olson.} I thank the chair. And welcome, Mr. Bardee and Mr. Cauley.

Our country is vast. Its size means a power crisis could happen anytime, anywhere. Hurricanes, tornadoes, earthquakes, floods, extreme heat, extreme cold. When that happens, DOE might order a coal or gas plant to stay online for a long time. We are talking about a short-term order; a matter of days, where the plant needs to run full throttle. That is the last line of defense to a power crisis. But by following that order, the plant might slip past the clean air permits. That isn't a loophole; that is DOE working to keep the lights on, and yet the plant can be penalized by another agency for extending those limits. This has happened before. Right across the Potomac on short--it is runway 1 at DCA, a Virginia plant was ordered to run beyond its permits. They were fined.

The first section of this bill deals with this problem. I wrote this language with my friends, Mr. Doyle from Pennsylvania and my Texan, Mr. Green, to protect our grid and our environment. It has passed this committee twice without

opposition. It has also passed the House twice without a no-vote. I am going to push that boulder up the hill one more time.

My question is, is this conflict still a threat, and could you discuss whether it is reasonable to trap a company between two regulators? You first, Mr. Bardee.

Mr. {Bardee.} We never know when that circumstance might develop again, but it is possible that it occurs again, and for that reason I think it would be helpful to have legislation that prevents utilities from having to choose between violating their obligations under the Federal Power Act and under an environmental law. They shouldn't have to make that choice. When they are told to run for reliability purposes under the Federal Power Act, they should just do that.

Mr. {Olson.} Mr. Cauley, your comments, sir?

Mr. {Cauley.} I agree. I support that. I think FERC has been effective up to this point in the isolated cases where this issue has come up where they have granted must-run status. If the 111(d) rule as proposed last year were to go into effect, which I hope--hopefully that it is not, that

there will be some changes, I think the frequency and breadth of those cases would be more frequent going forward.

Mr. {Olson.} Yeah. Back home, we had 2 power plants go out in Dallas, Fort Worth just because of ice. Put us into rolling blackouts/brownouts for about a 1-day period, so this is very important we get this right.

I want to follow, Mr. Bardee, dig deeper on a line of questioning from my colleague from New York about the physical and cybersecurity. In your testimony, the--you mentioned the process for setting standards is inclusive--now, I want to quote, ``but slow, open, and unpredictable.'' And you also said that there is, ``inadequate--it is inadequate for emergency action.'' My question is this. Without this bill, does DOE and FERC, or anyone else, have reasonable emergency authority for the grid? Do you have it right now? What has changed--what needs to change?

Mr. {Bardee.} I think this provision would be important to ensuring that the Federal Government could require the actions necessary in an emergency, whether that is cyber, physical, or other type of emergency. There are some authorities that could be used. Federal Power Act Section

202(c) that we just talked about has some value in certain emergencies. NERC has the authority to issue things like alerts and advisories, but they do not reach as comprehensively as the proposed legislation in the discussion draft, which I think would be important.

Mr. {Olson.} Thank you. Mr. Cauley, your questions--comments, sir?

Mr. {Cauley.} The language around--the words around standards being comprehensive and slow and deliberate and inclusive should not be an indictment of standard. Standards were not meant to deal with emergencies, and they don't. We did a physical security standard in 78 days. FERC approved it in 150 days. Standards were meant to be more enduring. Emergency powers do not exist, they are needed. We support legislation that addresses that. Emergency powers, in my view, are meant to deal with crisis issues. If--should one military facility have a priority over electricity customers in restoring power? Should one city be more strategic than another? The industry does not have the capability to make those decisions in insolation in a time of crisis.

Mr. {Olson.} My time has expired. Yield back. Thank

you.

Mr. {Whitfield.} At this time, I recognize the gentleman from Illinois for an opening statement. He was delayed because of a plane problem. So, Mr. Rush, you are recognized 5 minutes for an opening statement.

Mr. {Rush.} Thank you, Mr. Chairman. Mr. Chairman, I look forward to the days that we can have a hearing on airplane reliability.

I want to thank you, Mr. Chairman, for holding this important hearing on grid reliability and security.

Mr. Chairman, with recent high-profile cyberattacks on both private and public domestic targets, including entertainment companies, financial firms, and even the White House earlier this year, it is high time that this subcommittee revisit this extremely important issue of grid security and resiliency.

Mr. Chairman, if recent history is any indication, then it is not a matter of if but when some threat, whether it be a national disturbance, an individual hacker, a rogue state, or even a well-known foreign power, challenges the resiliency of our Nation's energy infrastructure.

Mr. Chairman, this issue of grid reliability and security must be addressed in a bipartisan manner. As was done in the past with the Grid Act that was originally introduced by then-Congressman Markey and the Full Committee Chairman Upton, which passed the House in June of 2010.

Mr. Chairman, while there are some worthy provisions in the draft that helps move the ball forward, there is still some work to do on some sections of this bill. Specifically, I have concerns with Section 1202 which requires FERC to conduct an ``independent reliability analysis'' of any proposed or any major rule that may have ``an impact on electric utility generating unit or units with a major rule defined as any rule estimated to cost more than $1 million.'' It is important that this section is not used, Mr. Chairman, as a backdoor attempt to block critical elements of 2 EPA rules that were promulgated recently. The final Mercury Air Toxic Standards, MATS, or the proposed Clean Power Plan, CPP.

Mr. Chairman, FERC or DOE already routinely coordinate with other federal agencies for proposed or final rules affecting the electric power sector, and it is not entirely clear if this provision could be used to prevent an agency

from issuing a statutory mandated final rule. In a section that will require more than--more work as 2004, and it is--as it is unclear if DOE or FERC would have the authority to address vulnerabilities or threats to the grid before they happen and take preventive measures. It is also not clear if this language authorizes requirements for restoration of grid reliability after an unforeseen act or event or attack.

Under the previously mentioned Grid Act, a ``grid security threat'' was defined as a substantial likelihood of a malicious act or natural occurrence, while in the discussion draft, acts or events must pose an imminent danger to the grid in order to be considered; setting a much higher bar for regulatory action. In addition to these concerns, Mr. Chairman, we want to continue to work with the majority to ensure that the final draft, specifically Sections 1203, 1207, and 1208, does not rely so heavily solely on traditional sources of energy, but also promotes the deployment and use of renewable energy sources. As the EIA reports, Mr. Chairman, there has been a shift in electricity generation toward cleaner sources of electricity, with 13 percent of electric generations coming from renewable

sources, including hydropower, in 2014.

Mr. Chairman, as renewable energy capacity continues to develop in the U.S. due to a range of emerging technologies and best practices, it is important that we integrate these renewable energy sources into the grid in order to boost fuel diversity, while also maintaining reliability.

So I look forward, Mr. Chairman, to today's witnesses. And with that I yield back.

[The prepared statement of Mr. Rush follows:]

********** COMMITTEE INSERT **********

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Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Illinois, Mr. Shimkus, for 5 minutes.

Mr. {Shimkus.} Thank you, Mr. Chairman.

This is a great hearing. Appreciate you all being here. We have great concerns about the change in base load generation based upon the focus of this Administration on continuing to ratchet-down emission standards to a point where base load goes off-line, and that is kind of the basic premise of a lot of our concern about reliability.

So under the--I was going on the Web site, FERC's responsibility is numerous things, independent agency, but obviously, on an independent agency that regulates the interstate transmission of blank, blank, blank, and electricity, which is a responsibility which you all have. So I think part of the testimony, Mr. Bardee, takes--kind of surprises us when, in your opening statement, you say that FERC lacks the tools and data to complete the reliability analysis. It is my understanding, based upon your mission statement, that is what you are supposed to do. So why do

you make that statement? Isn't that part of the mission statement of FERC to regulate the interstate transmission of electricity? And why do you say that, right now, you don't have the tools and data to be able to complete the reliability analysis that is, I think, mentioned in 1202?

Mr. {Bardee.} What I meant by that, sir, is we do have the staff with the expertise to be able to perform that kind of analysis, but we do not maintain fully current models, fully current data that will allow us to do that without requesting assistance from others to update us and provide us with the current models that they use, the planning authorities used, and the most up-to-date data.

Mr. {Shimkus.} And who are you referring by the planning--

Mr. {Bardee.} Planning authorities generally would be entities such as PJM; in the west, WECC, the Western Electricity Coordinating Council; in the southeast, Southeast Southern is the planning authority. In a similar way, NERC functions as capable of performing the same types of analyses.

Mr. {Shimkus.} And so--but EPA has--completes a

resource adequacy and reliability analysis for its regulations, but you all say that you lack the tools and the data. So--

Mr. {Bardee.} Well--

Mr. {Shimkus.} Let me just--I will just finish. Do--is EPA better positioned to complete the reliability analysis than you all are?

Mr. {Bardee.} No, we--sir, we are fully capable of doing that work, but if we were tasked to perform that kind of analysis, we would certainly prefer to turn first to the planning authorities and say please assist us, and then we will review your work, we may ask you to perform additional analyses, we may perform supplemental work of our own. We can do that work, but they do that work day in and day out and we do not. We just have that capability to perform it as-needed. And at times, we need to reach out and get information to assist us in performing that.

Mr. {Shimkus.} And can you help provide for the committee the--what the FERC proposed in its 2016 budget for that--for the Office of Reliability, and also the number of employees that are currently in that Office of Reliability?

Mr. {Bardee.} Yes, sir.

Mr. {Shimkus.} Thank you very much.

Mr. Cauley, on the--you mentioned the involvement in the ESI-ISAC, so I want to make sure I got that right. Can you explain your role in that, and which other agencies and stakeholders NERC collaborates with?

Mr. {Cauley.} I am the corporate CEO and heavily involved directly. I have two officers of the company who manage that for us. We coordinate with the entire industry. We have about 1,500 organizations that are registered users with the ISAC. We interface on a daily basis with DHS, the NKIC, DOE, NSA, FBI, and others, to share information.

Mr. {Shimkus.} And so you are testifying that it is a good model for voluntary information-sharing. This discussion draft, does this compliment the work at ES-ISAC?

Mr. {Cauley.} My sense is it doesn't really address it. The focus on information-sharing in the draft is focused on CEII information, which is system planning and study information that is filed with FERC or comes available to FERC, but there is a wealth, many more times more information that is shared unilaterally among the industry that never

goes to FERC--

Mr. {Shimkus.} Thank you very much. That--

Mr. {Cauley.} --that is not really addressed in the draft.

Mr. {Shimkus.} Yeah, that testimony is very helpful and we appreciate that.

And I yield back.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. {Green.} Thank you, Mr. Chairman.

Director Bardee, as I stated a few minutes ago, Section 1201 resolves an issue in federal law between reliability and environmental protection. Director Bardee, does FERC have any concerns that additional conflicts may arise as more environmental rules are promulgated?

Mr. {Bardee.} It is certainly possible that future conflicts will arise, as they have in the past, and for that reason I think the goal, the intent of Section 1201 is an appropriate one to find a way to resolve those conflicts so the utilities aren't stuck with an unenviable choice.

Mr. {Green.} Okay. Should Congress be on the lookout for conflicts? Section 1207 amends the Section 111(d) of the Public Utility Regulatory Policies Act, or PURPA, and includes states shall consider language. What role should PURPA play in markets?

Mr. {Bardee.} I think PURPA has served the role in the past, but the appropriate role going forward is not something I would be prepared to offer an opinion on at this point in time, sir.

Mr. {Green.} Okay. My understanding, within the last decade, the only real change in PURPA has been the ``states shall consider'' language. Are you of--either--are either of you aware of any broad changes in PURPA since the EPAC '05?

Mr. {Bardee.} I am not aware of any, sir. Not significant changes.

Mr. {Green.} Is PURPA still effective legislation, or should there be an effort to readdress PURPA in our committee?

Mr. {Bardee.} I could not say at this time, sir. I have not focused on that in my recent career.

Mr. {Green.} Okay. Section 1208 of the discussion

draft amends the Federal Power Act by adding a new section. Have Regional Transmission Organizations, RTOs, or Independent System Operators, ISOs, already performed the action under Section 1208?

Mr. {Bardee.} The RTOs and ISOs have certain market rules to ensure that they achieve their functions reliably, and those goals, in the capacity markets, for example, include ensuring that they have a reasonable set of resources to meet those needs. They have each taken different ways to do that, and the commission has allowed that flexibility for each to approach their task as they and their market participants through appropriate. And I think having that flexibility has been beneficial.

Mr. {Green.} Would FERC requirements bring any additional benefits to the market?

Mr. {Bardee.} Our goal has been, for many years now, to allow competitive forces to produce those benefits wherever possible, and to use more traditional tools only when those competitive forces were not sufficient.

Mr. {Green.} Okay. Mr. Chairman, I don't have any more questions. Thank you, and I yield back.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Ohio, Mr. Latta, for 5 minutes.

Mr. {Latta.} Thank you, Mr. Chairman. And thanks for our panel for being with us this morning. It is a very important issue.

I know many in this committee have heard me talk about what my district looks like in northwest and west central Ohio with just about 60,000 manufacturing jobs, and how important it is to have that base load capacity every day to turn those machines on to put so many tens of thousands of people to work.

And, Mr. Bardee, if I could ask this question to you regarding Section 1208, and I understand your concern about having Congress legislate instead of having FERC use the current regulatory structure to operate within the markets, but I also have heard again about the concerns surrounding the reliability and base load generation going forward, as well as the inability of some market structures to function properly. These concerns of many in the community believe that some legislation may be needed. Could you discuss some

ways that we could work together to address these concerns in the legislation?

Mr. {Bardee.} Certainly, I and others at the commission could work with the committee staff to see if there were appropriate legislative changes. My main concern would be to avoid codifying things that might have unforeseen harmful effects on those markets and restraining competition.

Mr. {Latta.} Could you maybe just enumerate what that might be?

Mr. {Bardee.} Excuse--

Mr. {Latta.} Could you enumerate what that might be? You say you would be concerned on some of the codifications.

Mr. {Bardee.} I don't have any specific suggestions right now on what would be appropriate to codify, but I would certainly be willing to discuss that with the committee staff.

Mr. {Latta.} Okay. Mr. Cauley, if I could ask you. Again, it is very important because, regarding the discussion draft that is before us today, why is it important that the definition of the grid emergency be limited in scope and duration?

Mr. {Cauley.} Pardon me? Could you repeat the question?

Mr. {Latta.} Yeah. Why would--why is it important that the definition of the grid emergency be limited in scope and in duration?

Mr. {Cauley.} Well, I think first, the industry is very adept at recovering the system in an emergency situation, and deploying resources and equipment to get the system back. And I think there are rare occasions and hopefully short duration occasions where we are facing a true national crisis, whether it is a large-scale cyber or physical attack or coordinated terrorist event, which could exceed on an interim basis the capability and the coordination of resources of the industry leadership. So I think those kinds of things are needed in a short period of time, but we should resist thinking that the government or Department of Energy would run the grid for months or, you know, operationally take over the grid. I think the leadership of the industry is very capable of taking--doing the operational aspects.

Mr. {Latta.} Let me just follow up. You know, when we are talking about these grid emergencies, and I have had some

discussions in regards to the electromagnetic pulse and geomagnetic storms and other, you know, terrorist-type actions or malicious acts that could happen, do we--you know, are we prepared right now do you think, Mr. Cauley, to meet those situations?

Mr. {Cauley.} We continue to get more prepared all the time. We have a very robust set of cybersecurity standards going into their fifth generation, very adaptive to the evolving threats situation. We have a new physical security standard that will safeguard the highest priority critical stations, that will--the first enforcement date for that is October. We have a new standard on GMD, withstand capability, so solar storms. We have--we are setting up that all equipment has to withstand a 100-year storm. So we are making progress in those areas. We do not have specific rules at this point regarding EMP, but we are making progress on what we perceive as the three active threat areas that we are focused on at this point.

Mr. {Latta.} Let me ask on the EMP, how concerned are you on those and that occurring?

Mr. {Cauley.} Well, I am concerned. There are

different forms of EMP. The nuclear blast form seems to be a very catastrophic national defense issue. It is very difficult for the power industry to defend against that as a civilian industry. In terms of a threat to substations, the handheld, vehicle-mounted EMP devices appear at this point to be a less imminent threat than physical attacks like shootings and bombs and cyberattacks, and those kinds of things, that we are working hard to protect against at this point.

Mr. {Latta.} Well, thank you very much.

And, Mr. Chairman, I see my time has expired, and I yield back.

Mr. {Whitfield.} At this time, recognize the gentleman from Pennsylvania, Mr. Doyle, for 5 minutes.

Mr. {Doyle.} Thank you, Mr. Chairman. And I want to thank you and the ranking member for holding this hearing on grid reliability. And I want to thank both you gentlemen for testifying today.

Mr. Bardee, I was glad to see your support for, as you say, the concept behind Section 1201 of this discussion draft. It is something that I strongly support too; that we

need to make sure that we keep the lights on for our constituents. It seems to be the main goal of the energy industry; providing power to people when they need it.

As many of the members of the committee know, we have been working with Congressman Olson and Green on this legislation for 3 years now to reach a compromise that eventually passed this committee last session by voice vote, and later passed the House by a voice vote.

Many of the questions that I have have already been asked, I just want to go over a couple of things. So you gentlemen both agree that it is important that we give the industry some clarity regarding what they are supposed to do in an emergency situation, is that correct?

Mr. {Bardee.} Yes, sir.

Mr. {Doyle.} And do you think Section 1202 accomplishes that goal, or is there something more that--you know, as you read the section, do you think it gets us where we need to be when we have those emergency situations?

Mr. {Bardee.} Sir, I don't have a--an opinion on the exact wording of this section. It certainly is aimed at addressing the concern that you have identified, and I

support, of providing clarity. Whether others think there might be, you know, slightly different wording that would be appropriate, I would defer to them.

Mr. {Doyle.} Um-hum. Mr. Cauley?

Mr. {Cauley.} And we would agree exactly. The purpose and intent is right, the general direction is right, but specific language we don't have an opinion on.

Mr. {Doyle.} Great. No, I understand. I heard both of you gentlemen express concern over a 90-day period that can conduct the reliability assessment. I just wanted to be clear what are you recommending? Obviously, you think 90 days is much too short of a time. Were you advocating--did I hear you say 120 days, or longer than that?

Mr. {Cauley.} I think one thing in that section of the draft, hopefully when it is concluded, will be more flexible in terms of understanding that not every conflict between reliability and other rules is going to be equal. Sometimes it might be regional, sometimes it might be a national issue, sometimes it might be very complex. A very short assessment period is 4 months. Extremely short with a limited scope. More complex ones, 6 months would be a minimum time to do a

competent job.

Mr. {Doyle.} Do you agree with that?

Mr. {Bardee.} I would agree, sir.

Mr. {Doyle.} So 4--a 4-to-6-month time frame you are saying makes a lot more sense than--and 90 days is just not practical. And let me just finally ask because, as I said, many of these questions have been asked already, but I want you both to just answer, you know, what really concerns you in terms of the greatest challenges that we are facing on grid reliability and security? What scares you that we either aren't paying attention to or aren't resourcing properly or, you know, what should we be focused on in terms of that? What do you see as those--the greatest challenges that we face on reliability and security?

Mr. {Cauley.} I will suggest two areas. One is a dramatic reform and transformation of the grid under the current environmental rules. There is a lot of change anticipated, a lot of shifting to new resources, new kinds of controls and dispatch, underlying infrastructure and transmission and gas pipelines to support that. So the concern is making sure that we have done the analysis, that

we know where we are going is safe, that we have the right resources, that we can withstand extreme droughts and heatwaves and cold weather, and not disappoint electricity customers. The second area that I worry about most is in the cyber and physical security area, and just making sure that our mounting defenses are good enough and we are staying ahead of the game with our adversaries.

Mr. {Bardee.} I would just add two more sort of subcomponents of what Mr. Cauley has just emphasized. As the grid continues to transform, I think we need to focus on 2 issues significantly. One is the growing dependence on natural gas means that we need to look and ensure that we have an adequate infrastructure, whether it be pipelines or dual field facilities or onsite storage, those kinds of techniques for ensuring that we can use the gas when we need to. And the other component that I would add is what has been called essential reliability services; things like voltage support and frequency support. As we change the resources that we rely on, we need to make sure we have the right tools in place, the right metrics, and the right standards.

Mr. {Doyle.} Thank you. Mr. Chairman, I see my time is expiring, but I would say that I think it would be shortsighted for us to put all our eggs in any one fuel basket, and we have a lot of work to do on energy infrastructure.

Thank you for the time.

Mr. {Whitfield.} Thank you very much.

And at this time, recognize the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. {Griffith.} Thank you very much. And appreciate you all being here for the hearing.

You just had a discussion in regard to the timelines that are built into the bill, and indicated that you all would need more time to do your analyses, isn't that correct?

Mr. {Cauley.} Yes. Yes, sir.

Mr. {Griffith.} And, Mr. Bardee?

Mr. {Bardee.} Yes, sir.

Mr. {Griffith.} And I certainly appreciate that and hope that we will incorporate that into the final draft. That being said, the Clean Power Plan requires the states to come up with I think it is 13 months, but less than a year

and 1/2. After the plan is a final rule, the Clean Power Plan requires the states to come up with their plan, which then must be--begin implementation by 2020. Doesn't that seem to be rather short? If it is going to take you all, the experts in this, more than 90 or 120 days to come up with an analysis of the plan, doesn't it just scream out that reason would call that the states need more time to come up with their plan as well?

Mr. {Bardee.} Certainly, I have heard representatives for states express their need for more time, and as you have heard here today, we have expressed a need for more time if we are given the responsibilities described in the legislation.

Mr. {Griffith.} And I certain appreciate that and understand that you do need more time. I also note that--Mr. Cauley, that NERC's recommendations in the 2 reports that have come out have both addressed that concern, not just on your behalf, but on concern of the industry and grid reliability, that there is more time needed to address the reliability concerns and infrastructure deployment, more time to accommodate reliability enhancement, more time to develop

coordinated plans to address shifts in generation. Is that a fair statement of your position?

Mr. {Cauley.} That is true, and I think you have touched on the planning and preparation is difficult. Some states might require legislation. It is broader, it includes energy efficiency and renewables. So we have--actually have the easy job of just doing the reliability analysis. I think it is very complex at each individual state, and it is going to be a challenge under those time constraints.

Mr. {Griffith.} And I do appreciate that. It is one of the reasons why I think your report highlights another important reason why we need to pass the Ratepayer Protection Act, which would require that the challenges--the legal challenges, I don't think they pass the muster. I think they fail in the courts on the Clean Power Plan. I don't think they have the authority under 111(d). But it requires that the issue be resolved before they can move forward, and that also would buy everybody a little bit more time to prepare if that is the direction we are going in.

Now, that being said as well, one of the things that your report showed, Mr. Cauley, your November report, in

there you said, potential issues are most acute in areas where power generators rely on interruptible natural gas pipeline transportation. Could you elaborate on that for just a minute for me?

Mr. {Cauley.} Well, my concern is that the business model for gas is different than the business model for electricity. In the gas industry, if you pay for a pipeline and you pay for capacity in a pipeline, you can have it and use it on a firm basis. The difficult is you don't want to pay for the entire year for those 3 days when you have the extreme cold in the middle of winter. So the--in the electricity side we have an obligation to serve and we must provide electricity. The disconnect is we don't see that same business model on the delivery of gas. So somehow those two disconnects have got to be dealt with.

Mr. {Griffith.} And you really don't have that problem if you are dealing with coal because they can just load some ore on a train or a truck, isn't that correct?

Mr. {Cauley.} Well, that is why fuel diversity is a benefit because some resources will have fuel onsite, and gives us some security, you know, even if the rivers are

frozen or something like that. If there is a pile there, we can get to it.

Mr. {Griffith.} Right. And your reports also show that--or indicate that, again, remember, we are talking about a plan coming out some time this summer, states have to have their plan done in 2016, and then compliance beginning in 2020, and yet in many areas of the Nation there aren't sufficient gas pipelines. As a result of that, in my region we have controversy over 2 pipelines that are now getting started, and they are laying out the plans and so forth. But I think your report indicated sometimes it takes 5 to 6 years just to get that up and running. And--am I not correct--is that correct?

Mr. {Cauley.} That is correct. In most cases, it does.

Mr. {Griffith.} And then that puts us beyond the 2020 start date to comply for the states, so it makes it very difficult for the states then to be able to use or to count on the natural gas that is not yet there, if it is just in the planning stages. And I would also note, because my time is running out, it also means that we don't have time for the clean coal technologies which the Department of Energy

indicate are probably going to be viable, at least 1 or more, by 2025 to incorporate those into the state plans that have to be done under the Clean Power Plan by next year, isn't that correct?

Mr. {Cauley.} That was the intent of our report, to highlight the physical constraints of getting there to the early years of the targets.

Mr. {Griffith.} I thank you very much, and yield back.

Mr. {Whitfield.} At this time, recognize the gentleman from New York, Mr. Engel, for 5 minutes.

Mr. {Engel.} Thank you. Thank you very much, Mr. Chairman.

Let me first say it is vital that we work together in a bipartisan way, so I thank you for this, to improve the reliability, resilience, and security of our electric grid.

Today, the U.S. electric power system consists of approximately 390,000 miles of transmission lines, including more than 200,000 miles of high-voltage lines, connecting to more than 6,000 power stations and 45,000 substations. Now, a report last year by the National Governors Association found that 70 percent of the Nation's transmission lines and

transformers are at least 25 years old, and 60 percent of circuit breakers are at least 30 years old. And it is noted that much of the infrastructure was designed in the 1950s, making this system, and I quote, ``vulnerable to disruption.''

Mr. Tonko asked a question about Hurricane Sandy. I want to go back to Super Storm Sandy, because that is a powerful example of one of those disruptions. Sandy swept through my district and the surrounding region in October 2012, knocking out power to over 8 million people. Some New Yorkers, including my district, waited more than 2 weeks for their lights to turn back on, struggling the whole time to keep their families safe and warm and fed. To protect against this type of outage in the future, New York is working to design and implement an initiative called Reforming the Energy Vision, or REV, and among other things, REV is designed to take pressure off the grid by promoting the generation of distributed power, such as solar, wind, combined heat and power, energy storage, and other systems, at customer locations. This would essentially turn electric utilities into a new kind of entity which, instead of

distributing electricity themselves, would effectively direct traffic by coordinating distribution of electricity produced by a multitude of smaller entities.

So let me ask you gentlemen, are you familiar with the REV initiative in New York, do you think its distributed generation model should be replicated in other regions, would the draft legislation we are discussing today encourage or discourage the use of this model?

Mr. {Bardee.} Sir, I am somewhat familiar with the initiative, and I think from my perspective, working at the commission, our goal would be to not impede New York's ability to do that and let them make those choices, as other states can choose for themselves what types of resources they think appropriate.

Mr. {Cauley.} I also am familiar from--a bit from afar. During Super Storm Sandy, the bulk power grid actually performed very well and remained intact during the storm. The vast majority of the impacts were at the distribution level, as I said, power lines down the streets and so on. I think anything that can be done to build resilience through the grid at both the distribution and the bulk power side is

helpful. I just do believe that it needs to be balanced in terms of reliance on a strong interconnected grid is helpful, but also having resources and backup capability at individual customers' critical loads is very important as well.

Mr. {Tonko.} Thank you very much. I think it is a good initiative, and we will--time will, of course, tell, but I think it is innovative and something that we should move towards.

In addition to managing demand and strengthening our grid to protect against power outages, I believe we must also look at ways to restore power if and when a disruption does occur. What do you believe are the most important things we can do to enable a rapid restoration of power?

Mr. {Cauley.} I think we look at Sandy as probably the most recent learning experience, and in many respects, the restoration was executed superbly in terms of moving of trucks and equipment and resources across long distances, and getting equipment back together. I think what I took away in a number of reports is sometimes we have to make sure that we are focused on the human toll during an event. People can't charge their devices, they can't find gas, in some cases food

may be hard to acquire, so I think that was a great learning from Sandy that it is not just getting the lights back on and the poles back up as quickly as possible, but how do you help the public cope during that event, and how do you make sure gas stations and other key resources have power that they need to supply citizens.

Mr. {Bardee.} I think the only thing I would add is in terms of design resiliency, there are things you can do in terms of the hardening of existing facilities. There are also techniques, and these were brought out to light by Hurricane Sandy. So I think those are also important aspects of how to address these going forward.

Mr. {Tonko.} You know the slogan, the perfect storm, this actually was the perfect storm, or most imperfect storm, but it was just something that, unfortunately, we can learn from it because a lot of people obviously suffered from it.

Thank you, gentlemen. Thank you, Mr. Chairman.

Mr. {Whitfield.} At this time, recognize the gentleman from Missouri, Mr. Long, for 5 minutes.

Mr. {Long.} Thank you, Mr. Chairman.

Mr. Cauley, during your question-and-answer session here

today, you said that hopefully there will be some changes to 111(d) before implementation. What type of changes would you like to see in 111(d)?

Mr. {Cauley.} I am hopeful, only because I have listened in public to statements by senior officials at EPA, so I have no particular information, but I think in terms of timing of the targets to make a more progressive transition. Ideally--

Mr. {Long.} More progressive?

Mr. {Cauley.} More--not in a political sense, but in a--

Mr. {Long.} Well, I know not the political sense, but I am talking about more rapidly, progressive?

Mr. {Cauley.} But to slow them down and phase them in more gently so that--essentially, the way the original proposal was is targets were, on average, you had to be 80 percent of the way there in the first year. That was too steep of a hill to climb, I think, physically in terms of reliability. So our suggestion in terms of timing would be to make the compliance targets more gradual, more phased-in over a period of time to allow us to make sure that the

infrastructure is there, gas and transmission and the dispatch capability is there to meet those targets.

Mr. {Long.} Okay. Yeah, I--on progressive, I didn't mean to imply politically, but I thought you were wanting to speed up the process--

Mr. {Cauley.} No, slow it down--

Mr. {Long.} --but the opposite is true?

Mr. {Cauley.} --on the front end.

Mr. {Long.} Yeah, okay. Also for you, Mr. Cauley, the EPA's proposed rule includes interim targets beginning in 2020. Based on this rule, 11 states have achieved--11 states must achieve 75 percent of the total goal for the first interim date of 2020. And my State of Missouri has to achieve over 60 percent total goal by then. What impact do you think the sudden change by states to meet the 2020 interim targets will have on reliability issues?

Mr. {Cauley.} Well, it creates challenges in terms of--if some units may be forced to retire, they are no longer economic, and particularly coal and base load units--

Mr. {Long.} And I might add we get 85 percent of our electricity from coal in Missouri.

Mr. {Cauley.} Some of those units might not retire, but might not be available to operate but at very limited times. In regions where gas--natural gas supply is an issue, going from less than 30 percent dependence on gas to 70 percent dependence creates a huge new demand on gas utilization, and whether the gas is going to be there every day in the cold days in the winter is going to be a challenge.

Mr. {Long.} Okay. Also for you, Mr. Cauley, the--when NERC puts out an alert, what is the general response time of the utility sector?

Mr. {Cauley.} The alerts vary. There is a level 1, 2, and 3, and we can set whatever response time is appropriate for the situation. A level 3 is the most urgent, and it requires a mandated response from the entities. Level 1 is an advisory heads-up, and level 2 is a recommended set of actions, but does not require a response back that it was completed.

Mr. {Long.} Okay, thank you.

And for you, Mr. Bardee, I understand you have concerns regarding the timing for FERC to complete its required analysis within the 90 days of being proposed. Wouldn't you

agree that having such a report would be beneficial to those members of the public submitting comments on the proposed rule?

Mr. {Bardee.} I think the analysis that we have seen, for example, in the context of the Clean Power Plan are certainly informative and useful, and I am sure the public has benefitted from seeing that information.

Mr. {Long.} Okay. What role should FERC have in the review of state implementation plans, and what about in review of federal plans?

Mr. {Bardee.} You know, the commissioners wrote a letter to EPA just this past week addressing that point, and what they indicated was that they felt they needed to be careful not to overstep their role and intrude on the authority and responsibility of states. But having said that, they indicated that the existing processes would be the starting point for how to address the reliability implications of those plans. And that could be supplemented with any additional guidance or work that the commissioners felt appropriate.

Mr. {Long.} To save me trying to run that down, could

you provide my staff with a copy of that letter?

Mr. {Bardee.} Yes, sir.

Mr. {Long.} Okay, thank you all.

And, Mr. Chairman, I yield back.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Illinois, Mr. Rush, for 5 minutes.

Mr. {Rush.} I want to thank you, Mr. Chairman.

Director Bardee, on the previous version of the Grid Act grid security threat was defined as a substantial likelihood of a malicious act or natural occurrence, while in the discussion draft, acts or events must pose an imminent danger to the grid in order to be considered for action, setting a much higher bar for regulatory action. In your opinion, does Section 1204 make it clear that DOE or FERC have the authority to address vulnerabilities or threats to the grids--grid before they happen, and can take preventive measures? Also, you had recommendations for clarifying that this language authorizes requirements for restoration of grid reliability after an unforeseen act or event. Can you also talk about these recommendations that you have?

Your mike--put your microphone on.

Mr. {Bardee.} The section would authorize Department of Energy to take these actions, not the commission, and it would address grid security emergencies, as you have indicated, defined as an imminent danger. Whether that gets to vulnerabilities is not clear to me. I don't think it would include a vulnerability unless it also posed an imminent danger. But I think, nonetheless, the authority in that provision would be a beneficial one and would allow the Department, the Secretary of Energy, to take action in an emergency, or after an emergency--well, let me put it this way. I would hope that the provision would be clarified to allow the Secretary to take action after an unforeseen attack or event. I think that is as important as being able to take action to protect against an--a foreseen imminent danger.

Mr. {Rush.} Mr. Cauley, do you have any remarks?

Mr. {Cauley.} Yeah, I support the direction of that section in the draft, and I agree with your point that the emergency may become apparent beforehand, and maybe we can prevent it. It may be how do you respond during an attack, and then how do you recover after the fact. And I think we

should be clear in the language that it would potentially have that authority during that entire span before, during, and after, as needed. So thank you.

Mr. {Rush.} In your testimony, Mr. Bardee, you note that for years FERC has sought to foster the development of competitive markets for wholesale electricity that benefit energy consumers by encourage the diverse resources, spurring innovation and deployment of new technologies. How does Section 1208 differ in its approach?

Mr. {Bardee.} Section 1208 would have the RTOs, the ISOs, and the commissions address whether those markets met certain parameters such as a diverse generation portfolio, stable pricing for customers, pricing adequacy for resources. And those are all considerations typically considered by states when they do integrated resource planning. But in the context of the wholesale markets, the commission has tried to rely more on competitive forces when those forces were sufficient, and the kinds of techniques I have just mentioned and that are included in Section 1208 could be applied--could construed in ways that would constrain those forces--those competitive forces unnecessarily, and that would concern us.

Mr. {Rush.} Does the legislative mandate drafted in Section 1208 maximize competition in order to best benefit consumers?

Mr. {Bardee.} Well, certainly, our goal under the Federal Power Act, as we administer it now, would be to do so; to maximize competitive forces within those markets for the benefit of consumers. And I would hope that our authority to do that is not constrained in ways that reduce those benefits.

Mr. {Rush.} I want to thank you, Mr. Chairman. I yield back.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentlelady from North Carolina, Mrs. Ellmers, for 5 minutes.

Mrs. {Ellmers.} Thank you, Mr. Chairman. And I would like to thank you also for this subcommittee hearing, and your staff for the hard work that they have done on this discussion draft. It is--as we all know, it is no secret that our grid infrastructure is aging and needs modernization. A more secure, reliable, and resilient grid is a matter of national security, and I am pleased to see the

leadership of this committee on this matter.

Mr. Bardee, I would like to ask you a question first. In November of last year, FERC issued Order number 802 approving the reliability standard which relates to physical security. Can you briefly explain on this new--what this new physical security standard is?

Mr. {Bardee.} Sure. The proposal sent to us by NERC and that we approved basically had 3 steps in it. The first was for the affected utilities to identify their critical facilities. The second was to then assess the threats and vulnerabilities that those facilities may face. And the third step was to develop a plan to mitigate those threats and vulnerabilities. Right now, the industry is working very hard to meet the first task; identifying their critical facilities. That is due to be completed in October, and then the other steps follow in sequence over time.

Mrs. {Ellmers.} Um-hum. And when we are talking about industry, are we also talking about the electricity sector?

Mr. {Bardee.} Yes.

Mrs. {Ellmers.} Yes, okay. Just to be clear. And is compliance mandatory?

Mr. {Bardee.} Compliance is mandatory.

Mrs. {Ellmers.} It is mandatory. Thank you.

Mr. Cauley, thank you for being here as well. And since becoming officially designated Electric Reliability Organization, established by Congress in 2005, what would you say has been ERC's most significant contribution to ensuring reliability?

Mr. {Cauley.} Well, I think there are many, but I think the mandatory standards and enforcement capability, we have a very comprehensive regime of compliance audits and reviews, has had a very significant improvement on the bulk power performance.

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} We have seen things like vegetation management issues that cause--were the triggering events for the 2003 blackout, have essentially gone to zero--

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --and so there are a number of areas where we have seen significant improvement and performance across-

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --electric industry.

Mrs. {Ellmers.} What do you feel--what else can be done in order to improve upon this?

Mr. {Cauley.} Well, we do a lot of other things. We are moving into an area of technical analytics where we can get a lot of detailed--

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --performance information. I think we are getting much smarter in the last few years about what causes equipment to fail and why do events happen. So we are getting that information out--

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --in terms of lessons learned and recommendations to industry.

Mrs. {Ellmers.} And what--and there again, when we consider industry, what more can industry do to improve upon this as well, and what part do they play?

Mr. {Cauley.} Well, industry has been working very closely with us. We have a number of technical--

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --committees. We--another example is the

polar vortex and the cold weather, there was a lot more--

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --there in a couple of events and we survived the most recent version of that with a lot of the information we were able to get out; why does instrumentation freeze up, what kind of exposure problems were we seeing. So we have been working with industry to turn that information--

Mrs. {Ellmers.} Um-hum.

Mr. {Cauley.} --back around. What I find is that most of the time in most issues, industry will do the right thing because they are interested in serving their customers as much as anybody else, if they know what it is that they have to do.

Mrs. {Ellmers.} Great, thank you so much.

Mr. Chairman, I yield back the remainder of my time.

Mr. {Whitfield.} Gentlelady yields back the balance of her time.

At this time, I will recognize the gentleman from Texas, Mr. Flores, for 5 minutes.

Mr. {Flores.} Thank you, Mr. Chairman, and I appreciate the opportunity to be part of this hearing.

Mr. Bardee, in your testimony you discuss the concern that the overlay of regulatory requirements in competitive markets may reduce the potential for these markets to provide consumers with the benefits achievable through competitive forces. Basically, I think what that report says is that we should let the electricity markets work in a free fashion and not distort them, in other words, not picking winners and losers. And so my next--my question is this. Can we infer based on the testimony that FERC does not approve of the wind production tax credit or state renewable requirements, or other similar actions that impair the ability of a competitive market to behave like a truly competitive market?

Mr. {Bardee.} I actually don't have an opinion on those particular issues, but certainly, the goal of the commission is to rely on competitive forces and prevent undue discrimination. That is our--one of our core responsibilities under the Federal Power Act, and we seek to do that so that all resources are able to compete in the wholesale markets.

Mr. {Flores.} Okay. Thank you. And, Mr. Bardee--or, excuse me, Mr. Cauley, you noted that FERC has recently

approved the NREC [sic] Critical Infrastructure Protection Version 5 standards which become enforceable on April 1 of next year, related to cybersecurity. First question is, can you briefly expand on the new Version 5 cybersecurity standards?

Mr. {Cauley.} Well, these are dramatically different. First off, they cover the entirety of the bulk power system, not just the high priority, highest voltage equipment. They require a risk-based controls approach, which means set up the systems to monitor, patch, keep up your defenses, as opposed to a sort of checklist-type approach. And those are the predominant changes, and it is prioritized, so we will have the most extensive controls on the highest voltage, highest critical equipment, and because of cost considerations and balancing risk, the lowest priority parts of the system will receive some amount of controls and assurance but not as extensive.

Mr. {Flores.} Okay. So the electricity sector is certainly subject to the standards. Is compliance mandatory?

Mr. {Cauley.} Yes, it is with everyone.

Mr. {Flores.} Okay. Mr. Chairman, that is all my

questions. Thank you, and I yield back the balance of my time.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from West Virginia, Mr. McKinley, for 5 minutes.

Mr. {McKinley.} Thank you, Mr. Chairman.

Couple of questions back on the Section 202--or 1202, and--dealt with the major rule in the billion dollar threshold. In the last two Congresses, we have been dealing with the threshold level of $100 million, and we have lowered that to $50 million for the reason that at $100 million, 98.5 percent of all rules fall under the $100 million classification. So I am curious, how many will fall above $1 billion annually?

Mr. {Bardee.} I don't have a sense of that, sir. It is just hard for me to know. I will tell you that from my experience at the commission, I can't think of a rule that would cross that threshold. Perhaps going back years ago to when we required open access, but I would have to go back and look at that.

Mr. {McKinley.} Okay. Just curious because I don't

think this is even going to apply at a billion dollars on that, so thank you, based on what we know from the Rain Act.

Secondly, Moeller from FERC was here several times, and made comments in 13 and 14. Both times he was saying from FERC that if we don't do something drastic here in Washington, we are going to see rolling brownouts in the Midwest by the year 2017. I--we asked that question of Ms. Miles that was here last week and she refused to comment. Do you have a comment about that? Is that an accurate statement, if we don't do something, we are going to see some brownouts? I heard you talk a little bit about gas pipeline networking and like--but given that the long length of time it takes to get that permitting and--are we facing that in the Midwest? Do you agree or disagree with Moeller's comments?

Mr. {Bardee.} Certainly, there will be work to do if EPA adopts a final rule for the Clean Power Plan, along the lines of developing infrastructure like I mentioned earlier, the gas infrastructure and also the electric infrastructure. Looking at the information that is available on the plan as it has been analyzed over recent months, I think some states

will have little difficulty complying with the plan. States like California or some of the states in the RGGI Program. On the other end of the spectrum, a state like Arizona would have significant challenge in doing that.

Mr. {McKinley.} Well, so does this mean--do you agree with Moeller's statement that we could have problems by--in 2017 if we don't do something?

Mr. {Bardee.} I think looking at the body--

Mr. {McKinley.} It is a yes or no--

Mr. {Bardee.} --of analysis--

Mr. {McKinley.} The--should be a yes or no. I am hoping--I am sorry, I read--the--we only have 5 minutes, we have to keep our responses as quickly--as short as possible. So is it, do you agree or disagree with Moeller?

Mr. {Bardee.} I would say, sir, that the industry has a history of meeting the challenges presented to it, whether you look back at something like the acid rain issue or transitioning to open access, like we--

Mr. {McKinley.} Well, this--thank you. This is Washington, I guess, we are not going to get that answer that I was looking for one way or the other.

Last--earlier this year, we had a panel up here that were talking about cybersecurity, and finally when I asked the question of all the issues that had been raised, where should we be prioritizing, and he sat--remember he sat at the very end seat, he said, on cybersecurity, he said, a high school kid could hack into our grid system in America within 4 days and shut our grid down. That ought to concern a lot of us about the capabilities or the vulnerabilities we have. Do you agree, both of you, that--how vulnerable we are with a high school kid being able to hack in and shut down our grid?

Mr. {Cauley.} I am not sure I agree with that specific example, but I do have cybersecurity as our number 1 priority on protecting the grid.

Mr. {McKinley.} Okay. Let's--in the time frame that I have, just--if you were starting together--Mr. Bardee, if you started from scratch with this legislation, because there has been some criticism and there has been some positives said about this, if you had to start from scratch, what would be the number one thing that you think we should do on grid reliability? First thing that--if you had to write a whole new bill, what would it be? What would be the first thing

you would include in it?

Mr. {Bardee.} I think I would start with Section 1204 on dealing with grid security emergencies. Of the issues in here, that would be my foremost--

Mr. {McKinley.} Okay, 1204.

Mr. {Bardee.} --recommendation.

Mr. {McKinley.} Okay, thank you.

And I am running out of time, so I yield back the balance of my time. Thank you very much.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Ohio, Mr. Johnson, for 5 minutes.

Mr. {Johnson.} Thank you, Mr. Chairman.

Mr. Bardee, I represent an area of our Nation, a swath of our state, Appalachia, where energy and electric reliability is of critical importance. Many seniors live out in rural areas. When the power goes out, cell phone towers are gone, telephones don't work, these--many of these seniors have health issues, no way to get in contact with them. I have had manufacturers coming to me saying that they have been approached by the energy companies asking them to idol

their plants for a period of time because there is not enough energy on the grid to meet peak demands. So electric reliability is a big issue. And when you look at power plants, they take a long time to build, so if we lose one to retirement, it can take perhaps bumping up on to a decade to get those power plants replaced.

Can you give me assurance today that we will have sufficient base load capacity available 10 years from now to assure electric reliability?

Mr. {Bardee.} What I would say, sir, is, as I mentioned earlier, the industry has a demonstrated history of meeting the challenges given to it.

Mr. {Johnson.} No, I don't want a political correct answer. That is a very simple question. In your position, can you assure me that we are going to have enough base load capacity to ensure electric reliability 10 years from now?

Mr. {Bardee.} I think the industry will do what it needs to do, sir.

Mr. {Johnson.} No, I am asking you your opinion.

Mr. {Bardee.} We will do what we need to do to fulfill our--

Mr. {Johnson.} Is that a yes--

Mr. {Bardee.} --responsibilities.

Mr. {Johnson.} --or--is that a yes?

Mr. {Bardee.} I think all of us are committed to maintaining reliability, sir.

Mr. {Johnson.} Okay. All right. Well, let me ask you another question then. Would you explain--because what I have heard you say is that you won't say yes, so I see that as a big maybe. So if we can't assure reliability, why would FERC have a problem asking RTOs that operate in capacity markets to bring in filings that give markets and consumers a longer term assurance of reliability?

Mr. {Bardee.} Do you mean how long of a contractual commitment--

Mr. {Johnson.} Yeah.

Mr. {Bardee.} --suppliers get in a capacity market?

Mr. {Johnson.} Yeah.

Mr. {Bardee.} We have allowed the individual markets to develop those rules. Some of them have a 3-year requirement, and some of them treat it as an annual requirement. And--

Mr. {Johnson.} But our legislation asked the RTOs to

bring in filings that give markets and consumers a longer term assurance. Am I correct that FERC opposes that language in the legislation?

Mr. {Bardee.} We do not think it would be helpful to codify requirements that--

Mr. {Johnson.} Why not?

Mr. {Bardee.} Because they would potentially restrict competition from providing--

Mr. {Johnson.} But isn't your job to ensure electric reliability?

Mr. {Bardee.} That is one of our responsibilities is to help--

Mr. {Johnson.} One of your responsibilities? You are the director of the Office of Electric Reliability.

Mr. {Bardee.} I meant the commission, sir.

Mr. {Johnson.} That should be your primary job, right?

Mr. {Bardee.} Me personally, my role is as the director of the Office of Electric Reliability, yes.

Mr. {Johnson.} All right. I am not sure why the FERC would have an issue with that.

Mr. Cauley, as envisioned by our discussion draft, you

stated that NERC would be pleased to coordinate with FERC on reliability assessments of rules that pose real or potential challenges to resource adequacy or the reliability of the bulk power system. Do you feel NERC is well suited for this additional responsibility, and if so, why?

Mr. {Cauley.} I think we are equipped today to do that, and we do those kinds of assessments on a regular basis. The only challenge might be resourcing based on volume and the timing.

One suggestion I had to help with the language is, it seems to specifically require those assessments for all rules. It seems there should be on a need basis, you know, the magnitude of the impacts and potential risks. So I think it is an authorization and a capability that should be there, but I don't know that it should be independent separate review for every single rule that might come out.

Mr. {Johnson.} Okay. All right.

Mr. Bardee, back to you. Would you agree that all generation does not possess equal reliability attributes?

Mr. {Bardee.} I think different resources have different capabilities.

Mr. {Johnson.} Okay, that is good. Would you also agree that the current capacity market, let's use PJM as an example, only sets a capacity target, in other words, the capacity market secures only a specific number of megawatts regardless of the reliability attributes, including location of those megawatts? Is that an accurate statement?

Mr. {Bardee.} My recollection is they do have some limits on demand resources, and obviously, there is litigation pending about that now. Looking ahead, there is a pending proposal by them to put in place capacity performance requirements which would differentiate between certain resources.

Mr. {Johnson.} Well, do you agree then that capacity doesn't necessarily equal reliability, does it? Those are 2 different things.

Mr. {Bardee.} You need to look at whether the resources you have will meet your needs in all appropriate circumstances.

Mr. {Johnson.} That doesn't answer the question. Does capacity equal reliability, in your mind?

Mr. {Bardee.} It depends on the kind of capacity you

have in mind, sir.

Mr. {Johnson.} I think that answer is no, Mr. Chairman, if I understood it. But I will yield back.

Mr. {Whitfield.} Gentleman yields back.

Now, I believe everyone has had the opportunity to ask questions, so that will conclude the--no, we would take a second round but we have another wonderful panel coming up. Thanks for that suggestion, John.

Listen, I want to thank you all very much for joining us, and we really appreciate your responding to our questions. And we look forward to working with both of you as we move forward, try to address some of these issues. So you all are dismissed.

And at this time, I would like to call up the second panel of witnesses. And we have 8 witnesses on the second panel, and I am just going to wait until it comes time to each one of you to give your opening statements and I will introduce you at that time.

But our first witness this morning, I am going to call on the gentleman from Mississippi, Mr. Harper, to introduce our first witness. If you would do that, Mr. Harper.

Mr. {Harper.} Thank you, Mr. Chairman. And I thank you for the recognition and for the opportunity to introduce our first witness on this panel. Tom Fanning is Chairman, President, and CEO of Southern Company, one of America's largest producers of electricity. He has worked for Southern Company for more than 30 years, and was elected president by the Board of Directors in July 2010. Mr. Fanning became president in August 2010, and CEO and chairman in December of 2010. Mississippi Power, a wholly-owned subsidiary of Southern Company, provides electricity in my home State of Mississippi, and I am glad Tom could be with us today to share on this important topic. His knowledge will benefit us as we move forward, and I appreciate his willingness to be here. Welcome.

Thank you, Mr. Chairman.

Mr. {Whitfield.} And, Mr. Fanning, we appreciate your being with us, and you are recognized for 5 minutes for an opening statement.

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^STATEMENTS OF THOMAS FANNING, CHAIRMAN, PRESIDENT, AND CEO, SOUTHERN COMPANY; ELINOR HAIDER, VICE PRESIDENT, MARKET DEVELOPMENT, VEOLIA ENERGY NORTH AMERICA (ON BEHALF OF THE ALLIANCE FOR INDUSTRIAL EFFICIENCY); JOSEPH DOMINGUEZ, EXECUTIVE VICE PRESIDENT, GOVERNMENTAL AND REGULATORY AFFAIRS AND PUBLIC POLICY, EXELON CORPORATION; MIKE BERGEY, PRESIDENT AND CEO, BERGEY WIND POWER, BOARD PRESIDENT, DISTRIBUTED WIND ENERGY ASSOCIATION (ON BEHALF OF THE DISTRIBUTED WIND ENERGY ASSOCIATION); JOHN MOORE, SENIOR ATTORNEY, SUSTAINABLE FERC PROJECT, NATURAL RESOURCES DEFENSE COUNCIL; JOHN DI STASIO, PRESIDENT, LARGE PUBLIC POWER COUNCIL; EMILY HEITMAN, VICE PRESIDENT AND GENERAL MANAGER, DEMAND SIDE ORGANIZATION POWER TRANSFORMERS, ABB, INC. (ON BEHALF OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION, NEMA); AND ELGIE HOLSTEIN, SENIOR DIRECTOR FOR STRATEGIC PLANNING, ENVIRONMENTAL DEFENSE FUND

CONGRESS

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^STATEMENT OF THOMAS FANNING

} Mr. {Fanning.} Thank you, sir, and thank you for that

introduction. Chairman Whitfield, Ranking Member Rush, and members of the subcommittee, thank you for inviting me to testify today.

My name is Tom Fanning and I am the Chairman, President, and Chief Executive Officer of Southern Company. With 4.5 million customers and approximately 46,000 megawatts of generating capacity, Southern Company is a leading U.S. producer of clean, safe, reliable, and affordable electricity. Providing reliable electric service is Southern Company's core business, and mitigating risks to reliability is vital to keeping the lights on for the customer and for a privilege to serve. I am also a chair of the Electricity Subsector Coordinating Council, or ESCC. The ESCC is the principle liaison between the electric sector and Federal Government for coordinating efforts to prepare for and respond to cyber threats, physical terrorism, and natural disasters that imperil critical infrastructure.

The ESCC is where the most senior leadership in the industry and government come together to improve the security, resiliency, and responsiveness of the industry, and by extension, the Nation. In that regard, I would like to

thank the American Public Power Association and the NRECA for their collaboration in the ESCC.

While the chair of the ESCC, I am speaking in my capacity as CEO of Southern Company. I am here today to talk primarily about the security, base load protection, and reliability analysis provisions found respectively in Sections 1204, 1207, and 1202 in the committee's recently released discussion draft on the energy reliability and security, part of the committee's architecture of abundance legislation. The committee is demonstrating leadership by proposing the discussion draft language to enhance system security and resiliency, retain the reliability and economic benefits provided by base load generation, and protect electric reliability.

I would like to respectfully offer a few items for the committee's consideration to further secure the effectiveness of this legislation. First, Southern Company supports Section 1204, provisions that would further facilitate industry-government coordination and information-sharing as the Nation addresses the emerging and constantly evolving electronic and physical threats to the availability of

reliable electricity. Because electricity is critical to the Nation's economy and to the lives of Americans, protecting the grid is a shared responsibility between the industry and government. Regarding language in the discussion draft providing the Secretary of Energy emergency authority to address grid security emergencies, the electricity sector widely recognizes the risk of imminent threats to the grid and the importance of rapid response. Should Congress feel that granting emergency authority is warranted, we agree that DOE is the appropriate agency to execute that authority. We believe that such emergency authority can most effectively be utilized if, as recognized by Section 1204, the industry is consulted to the extent possible prior to a directive's issuance. Such communication ensures that industry expertise is harnessed and incorporated into the emergency directives to more effectively assess the underlying threat, and develop modes of response. The ESCC is well-positioned to provide a ready conduit to allow for such government-industry consultations on emergency energy authority, and the ESCC should be added to any legislative list of entities to be consulted with prior to the issuance of emergency orders.

Provisions in the draft language exempting critical electric infrastructure security information from the Freedom of Information Act, and providing--and protecting such information from disclosure will boost the confidence of those like members of the ESCC who participate and collaborate in the sharing of information. Provisions in the draft increasing critical infrastructure sector access to classified information will further increase the operational awareness of those on the front lines of defending the electric grid. These provisions align with the ESCC priorities, and we also encourage ongoing efforts with Congress to pass broad information-sharing legislation that would apply to all critical infrastructure sectors, given their mutual interdependence.

Second, we support Section 1207 as a reasonable first step to promote efforts to ensure that base load generation continues to serve the energy needs of customers for many decades to come. Base load generation is vital to ensuring the continued supply of clean, safe, reliable, and affordable electricity to families and businesses because it provides 24 hours a day, 7 days a week capability to support reliability,

and it also helps ensure the affordability and stability of electricity prices.

Third, Section 1202's proposed reliability analysis requirement for new major federal agency rulemakings will fill a significant regulatory gap. In recent years, the Nation's fleet of electric generation facilities has been affected by the new regulations promulgated by the United States Environmental Protection Agencies that could have the potential to jeopardize the reliability of the bulk electric system. The proposed Section 1202 would ensure that the reliability effects of proposed or new final rule are assessed in a timely manner by the Federal Energy Regulatory Commission in coordination with the Electric Reliability Organization.

I thank the committee for holding this important hearing today, and giving me this opportunity to testify. And, Chairman, and all members, let me say I so applaud the notion of the architecture of abundance. You know, I speak nationally in many different forums about the notion of policy for the United States. It has been set for decades in the past on the notion of scarcity. We have a singular

opportunity today to set policy based on abundance, and that really does change out thinking. When I think about the obligation as CEO of one of the most important energy companies in America, and the obligation that you all have to face a broad constituency and the broad entrance of your constituency, then I think that what we must do is understand this notion that we have the opportunity to restore manufacturing in America, grow jobs, grow personal incomes, and make American lives better. And so this opportunity of clean, safe, reliable, affordable energy provided by nuclear, clean coal, natural gas, renewables, and energy efficiency, is something we can all stand behind. But it goes beyond the blessings of this Nation's resources. It really goes to issues that you all have already talked about. Chairman Whitfield, you referred to it, Congressman Barton referred to it, and it is the notion of market design, because when I think about the excellent design, where I come from, the southeast, an integrated regulated market design, we are incented to provide the best reliability and the lowest prices, with the best customer service possible. Different deregulated markets are incented actually the opposite way;

acting completely rationally in an economic manner, they benefit from a lack of reliability and higher prices and more volatility. We think the work you are doing is really important to the success of the American economy.

Thank you very much.

[The prepared statement of Mr. Fanning follows:]

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Mr. {Whitfield.} Thank you very much. Appreciate that.

And our second witness today is Ms. Elinor Haider, who is Vice President, Market Development, at Veolia North America. And she is testifying on behalf of the Alliance for Industrial Efficiency.

Welcome, and you are recognized for 5 minutes.

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^STATEMENT OF ELINOR HAIDER

} Ms. {Haider.} Thank you. Chairman Whitfield, Ranking Member Rush, and of--other members of the subcommittee, thank you for the opportunity to testify.

My testimony will address the role of combined heat and power in enhancing resiliency and reliability. With 180,000 employees worldwide, Veolia has been creating integrated energy infrastructure and environmental solutions for over 160 years. Last year, Veolia supplied 150 million with drinking and wastewater services, produced 52 million megawatt hours of energy, and converted 31 million metric tons of waste into new materials and energy.

In the U.S., our 8,000 employees ensure the reliable, efficient supply of energy with over 500 megawatts of owned or operated combined heat and power, and the largest portfolio of district energy systems. Veolia is a member of the Alliance for Industrial Efficiency, a diverse coalition that includes representatives from the business, environmental, labor, and contractor communities. The

alliance is committed to enhancing manufacturing competitiveness, and creating job through industrial energy efficiency, particularly through the use of combined heat and power and waste heat to power. Both Veolia and the alliance are pleased to see the recognition of CHP's grid resiliency benefits in Section 1207 of the committee's discussion draft.

Conventional power generation is inefficient. More than 2/3 of the fuel inputs are lost from our smokestacks as wasted heat, and never converted to useful energy. Another 7 percent is lost in the transmission and distribution of electric energy over long distances and multiple voltage changes. The energy lost in the U.S. from wasted heat in power generation is greater than the total energy use in all of Japan. This inefficiency costs consumers and businesses, and harms America's competitiveness. By making use of both heat and electricity from a single fuel source located closer to the user, CHP dramatically increases fuel efficiency and eliminates much of this waste. CHP typically uses more than 70 percent of fuel inputs. By producing both heat and electricity on-site and independent of the grid, CHP can run without interruption during an extreme weather event.

As one of the U.S.'s leading owners and operators of CHP systems, Veolia's customers benefit from the energy efficiency and resiliency provided by CHP at universities, hospitals, biotech, R&D, and other critical facilities.

The benefits of this expertise were on stark display during the $70 billion Super Storm Sandy. While nearly 8 million residents across the Mid-Atlantic lost power, those with resilient CHP systems kept the lights on. There is no more illustrative case than New York University where Veolia has played a critical role in implementing CHP. NYU has 2 campuses in Manhattan. Ten years ago NYU selected Veolia to serve as owner's representative, to design and manage expansion of its Washington Square Campus energy plant. The expanded CHP system generates up to 90,000 pounds of steam per hour, and 13 megawatts of electricity, serving 37 buildings. While the majority of Manhattan was without power during Sandy, that campus had electricity, heat, and hot water. It became a place of refuge during the height of the storm. That NYU campus kept the lights on. On the other hand, NYU Langone Medical Center did not have CHP. It lost all power, knocking out its communication systems, and

leading to the dangerous forced evacuation of critical care patients on gurneys and in dozens of ambulances.

In response to its experience at the 2 campuses, NYU selected Veolia to support development and operations of a new CHP energy plant for the NYU Langone Medical Center campus. The new plant has 13 megawatts of electric generating capacity, and 165,000 pounds per hour of steam. It will be completely self-sufficient in the event of a utility power interruption. NYU Langone will also keep the lights on. When we consider energy resiliency, the price of inaction, such as the $540 million in FEMA-funded repair work at Langone, needs to be considered in our cost benefits analysis.

In the aftermath of Super Storm Sandy, New York, New Jersey, Massachusetts, and Connecticut have each adopted policies to support greater use of CHP. Other regions have also long recognized that CHP can help keep critical infrastructure online during extreme weather events. Following Hurricanes Katrina, Rita, and Ike, Texas and Louisiana adopted legislation to encourage CHP deployment in critical facilities. Texas has model legislation that

requires critical public facilities to obtain a CHP feasibility study during any renovation or new construction, and has laws that set minimum efficiency and resiliency requirements for CHP systems. By encouraging electric utilities to develop a plan to increase the utilization of resiliency-related technologies, and supporting cost recovery for such systems, the committee's discussion draft takes an important step to help keep the lights on during extreme weather events.

Both Veolia and the Alliance for Industrial Efficiency look forward to working with the committee as it continues to make these recommendations a reality through the architecture of abundance.

Thank you for the opportunity to testify.

[The prepared statement of Ms. Haider follows:]

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Mr. {Whitfield.} Thank you.

And our next witness is Mr. Joseph Dominguez, who is the Executive Vice President for Government and Regulatory Affairs and Public Policy, with Exelon Corporation.

So welcome, and you are recognized for 5 minutes.

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^STATEMENT OF JOSEPH DOMINGUEZ

} Mr. {Dominguez.} Thank you, Mr. Chairman, members of the subcommittee, thank you for the opportunity to be here today.

I work for Exelon. I head public policy for Exelon. We have three major utilities serving about 8 million customers. We are probably well--most well known as being the Nation's largest owner and operator of nuclear facilities. We have about a 1/4 of the Nation's fleet. We also buy and sell electricity and gas in about 48 different states.

I am going to focus my comments today on Section 1208 of the discussion draft, and I am going to try to reflect some of the questions and answers that have already been rendered here today.

It is universally recognized and very often stated that we are in the midst of this major transformation in the electric sector. In fact, it is so often stated that it is almost a waste of your time to hear it again, except to put it in context. No one believes this transformation is going

to occur immediately. It is going to unfold over many decades. The cost of the transformation is yet unknown. It will have reliability impacts. And so we need to focus, while we focus on new technologies, also on the existing steel in the ground. I believe that Section 1208 begins an important discussion of the value of base load assets, but more importantly, of the value of all central assets to maintaining reliability for consumers.

Today's hearing is appropriately timed. Chairman Whitfield talked about the stresses on coal plants across the country. Those stresses are being equally felt on nuclear facilities across the country. About 5 percent of the nuclear assets in the country have announced retirement. Additional units are slated for retirement by 2019. Wall Street analysts and some academics talk frequently about the potential for up to 25 percent of the Nation's fleet to retire.

Ironically, nuclear faces this crisis at a time where its zero carbon attributes and its inherent reliability should be most valued from a policy perspective. Nuclear power offers a host of benefits. It provides over 60 percent

of the Nation's zero emission electricity. The units operate at over 90 percent reliability across the country. And the polar vortex and PJM was a good illustration of how valuable these units are for supporting reliability for the 61 million customers in that RTO. And on January 7 of last year, we often talk about almost losing the system across this 13-state region. In point of fact, we did lose the system from the perspective of not having enough contracted resources, contracted capacity to keep the lights on across the region. But for voluntary participation from some demand response Providers, but for the fact that we have some emergency imports from other regions of the country, we would have had to go into load shedding in the teeth of the worst winter. The performance of the units on that particular day was extraordinarily poor. We lost about 47 percent of the natural gas units across PJM, accounting for something like 20,000 megawatts of electricity. We lost 34 percent of the coal that day. We lost 26 percent of the oil-fired generation. And because the wind wasn't blowing, we didn't get a particularly good performance from renewables. The fact of the matter is that nuclear fleet across PJM was the

reason we didn't have an outage. Over 97 percent of the fleet continued to participate, and that, along with hydro, carried the system on its shoulders.

There have been a number of findings as a result of the polar vortex experience. One of those findings is that the capacity products we have in this RTO aren't sufficiently, aren't proportionately, well designed to meet the load requirements in the RTO. This is not a new problem. It was a problem that was understood and addressed by the New England ISO a couple of years in advance of PJM, but it took a crisis in PJM, or a near crisis, to bring it to the attention.

Section 1208 properly drafted could codify some of the lessons learned, and require that other RTOs embrace those lessons learned as we move forward. And I am talking about New York, I am talking about MISO, I am talking about California RTOs. Additional work needs to be done, and it can't be done after a crisis or a near crisis.

So we support the concepts in 1208. It has been talked about today as being anti-distributed generation or anti-renewable. I think the appropriate focus here shouldn't be

on the type of technology, but what we want out of that technology. The discussion draft indicates that we want something like 30 days of available fuel on-site, or available to--through contract to support the Nation's needs in the time of an emergency. No one is planning for that. At best, what we are planning for is avoiding a 1-in-10-year crisis, but no one is planning for having a system that would be available, for example, if a terrorist attack or a cyberattack undermined the gas infrastructure in the country, taking out natural gas availability. We don't have a long-term plan for that. I think 1208 begins that discussion, and I think it is a necessary discussion and one that will be helpful to all the RTOs, and properly fashioned, will not exclude any technologies from participation.

[The prepared statement of Mr. Dominguez follows:]

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Mr. {Whitfield.} Thank you very much.

Our next witness is Mr. Mike Bergey, who is the President and CEO of Bergey Wind Power. He is also Board President of the Distributed Wind Energy Association, and is testifying on behalf of the Distributed Wind Energy Association.

So welcome, Mr. Bergey, and you are recognized for 5 minutes.

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^STATEMENT OF MIKE BERGEY

} Mr. {Bergey.} Thank you, Mr. Chairman. Thank you, Ranking Member Rush, and the subcommittee members for giving me the opportunity to appear before you today.

My name is Mike Bergey. I am President and CEO of Bergey Wind Power Company, a 38-year-old Oklahoma family-owned business that manufactures wind turbines. We have--we are currently the world's leading supplier of small wind turbines, and we have supplied turbines in all 50 U.S. states, and over 100 countries around the world.

As you mentioned, I am also President of the Distributed Wind Energy Association, which represents the behind-the-meter distributed generation segment of the wind industry. Not the wind farms. That is the American Wind Energy Association. We have a little over 100 members. They are mostly small businesses.

Last year, 94 percent of the small wind turbines that were installed in America were built here. So we are also part of the renaissance of American manufacturing.

I have commented in my written testimony on all 8 proposed sections, but I would like to confine my comments today to Section 1207, because I believe that it has the largest potential from my perspective of increasing the resiliency of the Nation's electric power grid. It proposes to do so by modifying PURPA. And I have some experience with PURPA because I was involved with the first--when it was passed, and the first implementations at the very state level. I think it is a very powerful tool. I do like 1207's prescription that regulatory agencies and utilities will have to look at various ways to enhance resiliency. I will point out that PURPA, back in 1978, under Section 210, was a critical element in the rise of distributed generation in America, and it sparked the creation of thousands of companies, millions of jobs, and hundreds of billions of dollars in new investments in energy generation technologies. I do see merit, as I said, in requiring the states to take a look at the opportunities. Some states, that will be duplicative; California, New York come to mind, but it will also serve to get other states like Oklahoma off the dime on that. So that would be welcome.

That said, I would like to point out some issues that I see in the current draft of 1207 as being somewhat problematic. First, it would seem to cover only regulated utilities, so unregulated utilities, which include many rural co-ops, would seem to get a pass under this. I may not--I may have missed something, but that is my reading.

Secondly, it does not specifically mention renewable distributed generation. It does mention distributed generation, but not renewable. But renewable distributed generation is a fast and growing segment of the distributed generation market, and one with the greatest application to grid resiliency.

And finally, it provides a counterintuitive emphasis on base load generation. On this last point, I say counterintuitive because, as an engineer, it is my understanding that a fewer number of larger assets is more vulnerable and less resilient than a system with a higher number of smaller assets, particularly if they have greater special and fuel diversity. After you factor-in dependency on functional--on the T&D network for base load plants to serve critical loads, I see the proposed Section 22 as

undermining the intent of Section 1207, and potentially nullifying the gains to be made in Section 20(b). It is now well-established that an intermittency is manageable through combinations of complimentary technologies, such as wind power and natural gas-fired combustion turbines. So I see no compelling technical reason to elevate base load plants to a protected status. Reliability is the issue, not the way in which we get there.

The potential for distributed generation to contribute to the modern grid should not be underestimated. We have just done a white paper that shows tremendous potential for distributed wind. The same could be said for distributed solar. And I think emerging storage, there are lots of exciting new additions out on the distribution network that can give us additional grid resiliency.

My primary request of this committee is to bolster Section 1207 to take advantage of the opportunities in emerging distributed renewable energy, storage controls, and other grid-enhancing technologies offered today and tomorrow. If there are legislative opportunities to promote distributed generation beyond the discussion draft, I would encourage the

committee to seize those opportunities. Doing so will help build the American economy, while delivering the improvements in energy reliability and security that we all would like to see.

In summary, I believe the discussion draft contains many worthwhile aspects, but I think it can be improved upon. I appreciate that it is a draft, and I look forward to working with the committee and the staff on further improvements.

Thank you for the opportunity.

[The prepared statement of Mr. Bergey follows:]

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Mr. {Whitfield.} Thank you, Mr. Bergey.

And our next witness is Mr. John Moore, who has been here a few times before, and he is our Senior Attorney for-- and also involved in the Sustainable FERC Project, from the Natural Resources Defense Council.

Mr. Moore, welcome, and you are recognized for 5 minutes.

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^STATEMENT OF JOHN MOORE

} Mr. {Moore.} Thank you, Mr. Chairman Whitfield, Ranking Member Rush, and members of the subcommittee.

My name is John Moore, and I am delighted to be here to participate in this hearing today.

I am a senior attorney at the Natural Resources Defense Council. Most of my work at NRDC is for something called the Sustainable FERC Project, which, as the name suggests, is a coalition of environmental and clean energy groups that support cleaner, more reliable, and affordable energy future primarily through reforms to FERC and FERC jurisdictional markets.

Now, I want to make three points today, primarily. One, the grid is a dynamic and always-evolving entity. But that is okay. We have kept calm, we have planned ahead. The grid operators and states are doing their jobs. Second, environmental standards are compatible with reliability. And third, Congress should take care not to do anything that would impede innovation, hamstring grid planners, and prevent

economic progress.

So since 2005, our Nation has retired over 90,000 megawatts of older and dirtier power plants, while adding over 200,000 megawatts of newer and cleaner utility-scaled generation, along with many thousands of megawatts of energy efficiency, rooftop solar, small wind, intelligent energy management systems. Already, we are halfway to that 30 percent goal of cutting carbon pollution by 2030. We are already making progress.

Now, speaking of dates, did you know what happened on 20--on April 16 to the grid? I will tell you. Nothing happened, which is a good thing for the grid. That was the initial compliance deadline for the Mercury and Air Toxics Rule, which EPA issued in 2012. Now, remember, many opponents of the MATS worried that when we reached this deadline there would be blackouts and other reliability problems. That did not come to pass. Power companies planned ahead to upgrade or retire power plants and build new resources. The grid adapted and it will continue to adapt thanks to the hard work and ingenuity of our grid planners; 2 of whom we have already heard from.

The same will be true with the Clean Power Plan. This standard offers unparalleled flexibility, more so than any other previous Clean Air Act standard, for states to choose among different compliance solutions, while preserving and even strengthening reliability.

So as you work through this legislation, we encourage you to preserve the flexibility of electricity markets, states, and grid planners to adapt and innovate to always-changing circumstances.

To that point, we are concerned with several provisions in the discussion draft that could conflict with these goals. First, Section 1201. It provides broad amnesty for power plant owners from liability under environmental laws. It fails to acknowledge carefully designed environmental standards that were intended to prevent reliability conflicts from arising. The Clean Power Plan is one example of that. It could increase conflicts between reliability and compliance, and threaten human health and the environment.

Second, Section 1202 requires FERC to assess the grid impacts of federal rules that could affect power plants. This provision is unnecessary because, as FERC points out in

its recent letter to EPA, we have already heard about that letter today, FERC jurisdictional grid regions already are required to assess the impacts of the environmental standards on grid operations. So existing processes are the foundation for compliance moving forward.

Finally, we have concerns about the base load elements of Section 1207 and 1208, which we believe unfairly preference expensive base load generation over other resources, specifically, by freezing the grid's evolution in a moment in time now, and creating a one-sized rigid system. At a time when many regions are working to develop the nimble, flexible, and reliable systems that we need to cope with increasingly extreme weather events, these provisions would move us backwards.

So in closing, let's focus on policies that protect reliability while cutting pollution, expanding our economy and saving consumers money.

Thank you.

[The prepared statement of Mr. Moore follows:]

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Mr. {Whitfield.} Thank you, Mr. Moore.

And our next witness is Mr. John Di Stasio, who is the President of the Large Public Power Council.

Welcome, and you are recognized for 5 minutes, Mr. Di Stasio.

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^STATEMENT OF JOHN DI STASIO

} Mr. {Di Stasio.} Thank you, Chairman Whitfield, Ranking Member Rush, members of the subcommittee, and fellow panelists. Thank you for inviting me to testify today. I am honored to appear on this panel of distinguished witnesses, and appreciate the opportunity to address the important issues facing the electric sector as the country pursues key national priorities.

As was mentioned, my name is John Di Stasio. I am the President of the Large Public Power Council, also known as LPPC. Before I assumed this role earlier this year, I was the CEO of the Sacramento Municipal Utility District, a public power system located in northern California.

So LPPC is an organization of the 25 largest public power utilities, providing electricity to 30 million consumers across 13 states, many that are represented by members on this subcommittee, including Texas, North Carolina, Oklahoma, California, New York, and Florida. LPPC members are also dedicated to protecting the environment and

the health and welfare of the communities we serve. About 36 percent of LPPC member-owned supply is carbon-free, including wind, solar, nuclear, and hydro, and this number is expected to grow by 10 percentage points in the next 10 years. Over the same period of time, LPPC members are also projected to purchase an additional 5,000 megawatts of carbon-free power, which will comprise 90 percent of the member supply purchases.

We are clearly in the midst of a transition to a cleaner supply mix and a more dynamic electric system. As members of the subcommittee are vitally aware, a significant aspect of this transition is the need to anticipate a myriad of changes required to meet grid modernization, environmental goals, reliability, resiliency, and physical and cybersecurity goals. The move to different base load generation, resiliency--excuse me, integration of growing intermittent resources and new technologies is technically achievable, but it does require thoughtful planning, implementation, and coordination across systems and regions. Current reliability provisions in the Federal Power Act clearly did not envision a transformation of the U.S. electric power sector, and the--

while the current system is robust, it is not infinitely flexible. This transformation will not end in the next 15 years, given the need to deal with other important priorities in the future. So an appropriate, up-front reliability assurance mechanism, right sized to the risk, will serve us well in that long transition.

I have the following points in this regard. LPPC's systems are consumer-owned, so we are directly accountable to the consumers and the communities we serve. They are affected by our actions, so we seek to balance reliability, affordability, and environmental stewardship. All reliability issues can be overcome with enough time and money, but assuring reliability prospectively when major changes are under consideration will present--will prevent unnecessary delays and additional costs for consumers. After-the-fact reliability review mechanisms are also vital, but they are triggered by emergencies or unforeseen conditions, as opposed to preventing them in the first place. The members of LPPC are committed to reliability and resiliency, and recognize an increased responsibility in that regard. Given an increasingly digital world and a variety of

new and emerging risks, we work closely with Federal Government in a variety of ways to proactively address challenges, and we are committed to do so going forward.

I also want to thank the chairman for the discussion draft released May 7. LPPC's members are reviewing the specific sections and the legislative language in detail, and will be pleased to work with the members of this subcommittee and full committee to provide more specific input as the language is further refined.

With that, again, I want to thank the chairman and members of the subcommittee for their attention, and I would be happy to address any questions that you have for me.

[The prepared statement of Mr. Di Stasio follows:]

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Mr. {Whitfield.} Thank you very much, Mr. Di Stasio.

At this time, our next witness is Emily Heitman, who is Vice President and General Manager for the Demand Side Organization Power Transformers, at ABB, Inc., and she is testifying on behalf of the National Electrical Manufacturers Association.

So you are recognized for 5 minutes.

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^STATEMENT OF EMILY HEITMAN

} Ms. {Heitman.} Good morning, Chairman Whitfield, Ranking Member Rush, and members of the subcommittee. My name is Emily Heitman, I am Vice President and General Manager of the Commercial Operations for Power Transformers at ABB. Thank you for inviting me to speak today on behalf of ABB and the National Electrical Manufacturers Association.

I will be walking through the critical nature of large power transformers, the challenges in replacing them, industry and ABB's efforts thus far to mitigate resiliency risks, and what is lacking in those efforts.

ABB is a leading manufacturer of power and automation products, and services for utilities, industry, government, and transportation. We are the largest supplier of electrical grid systems and large power transformers across the globe.

One of the most essential components of the electrical grid is the large power transformer, otherwise known as the LPT. LPTs either increase the voltage of electricity from

generation sources for long-distance transmission, or decrease the voltage of electricity close to the end-user. The failure of a single LPT can cause a power disturbance, however, the concurrent failure of multiple LPTs could lead to a significant widespread outage. While designed to withstand operational risks, such as lightning strikes and power fluctuations, LPTs are still vulnerable to a number of threats, like extreme weather events, intentional criminal attacks, geomagnetic disturbances, and electromagnetic pulse. Furthermore, the U.S. fleet of LPTs is aging, and older units may be more vulnerable to disruption.

While most utilities do own a spare, for each large power transformer design, they are generally placed directly next to the units in use and are subject to the same risks that were just previously mentioned. Replacing a damaged LPT is especially difficult. The time to manufacture a new unit will--which requires both designs, since few LPTs are made to the same specification, and production, can take anywhere from 12 to 24 months. LPTs have unique materials and components associated with their manufacturing, and unfortunately, periodic material and component shortages can

also delay their production. Once manufactured, the transportation and delivery of these large, ultra-heavy units also pose challenges. LPTs can weigh more than 400 tons. This size and weight often requires delivery by specialized train cars and trucks, of which there is limited availability in North America. In addition, with many of the existing LPTs having been in place for more than 40 years, the routes of access once available may have since been derated or even removed, leaving some substations and LPTs virtually stranded. Since a large power transformer must be disassembled to ship and then reassembled on-site, unique knowledge, skills, and equipment are necessary to complete the final installation of an LPT.

Now, industry and government have both been responsive to these challenges. NEMA has brought together transformer manufacturers to develop industry recommendations. NEMA is not alone. The Edison Electric Institute, the Department of Energy, NERC, FERC, and the Department of Homeland Security have all taken important steps to address grid resiliency. We support and applaud all of these efforts, but we are concerned that gaps still remain. At ABB, we are developing

solutions to significantly increase transformer resiliency. These apply to both existing and new transformers. ABB's approach has 5 components: vulnerability assessment, design modifications to harden the transformer, remote monitoring and communications, rapid damage assessment and repair, and rapid deployable transformers. But it is important to recognize that the development of a rapidly deployable transformer will only reduce the time it takes to transport and energize an LPT. The manufacturing of those units still take months. Should an event occur that requires a replacement transformer, utilities would still face a long delay if there is no replacement unit in reserve.

H.R. 2244, authored by Congresswoman Renee Ellmers and Congressman Jerry McNerney, as well as the Energy and Commerce Committee's discussion draft addressing reliability and security, direct the Department of Energy to produce a plan to create a strategic transformer reserve. ABB and NEMA support this legislation. We believe the creation of a strategic transformer reserve will fill a gap in our Nation's capability to respond to the catastrophic loss of several LPTs. Having reserves of LPTs located at strategic points

around the country would improve grid resiliency and complement existing industry programs. Given the complexity of the electric system, precisely how a strategic transformer reserve should be designed and operated warrants further analysis. H.R. 2244 and the committee draft direct DOE to undertake the needed review. They offer an appropriate response to a significant vulnerability to our Nation's electric grid and we urge the adoption.

ABB and NEMA would like to once again thank the committee for inviting us to testify on this important topic. Improving the security and resiliency of our energy infrastructure requires ongoing cooperation between government and industry. ABB and NEMA are fully committed to this effort.

I look forward to answering your questions.

[The prepared statement of Ms. Heitman follows:]

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Mr. {Whitfield.} Thanks very much, Ms. Heitman.

And then our next witness is Mr. Elgie, is it Holstein or Holstein?

Mr. {Holstein.} Holstein, thank you.

Mr. {Whitfield.} Holstein. Mr. Elgie Holstein, who is the Senior Director for Strategic Planning, at the Environmental Defense Fund.

We are delighted you are with us today, and you are recognized for 5 minutes.

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^STATEMENT OF ELGIE HOLSTEIN

} Mr. {Holstein.} Mr. Chairman, thank you--and members of the subcommittee, thank you for this opportunity to share our thoughts about the draft bill before you today.

Achieving environmental reliability and other goals of grid modernization will be hindered by any measures that straightjacket rather than enhance the grid's increasing agility. That is the risk represented by Section 1202 of the draft, which requires the preparation by FERC and NERC of an independent regulatory analysis for any major proposed environmental rule. Simply stated, this appears to be an overreaction to fears about the rapid changes underway in the electric utility industry, and perhaps to EPA's proposed Clean Power Plan. Those fears are groundless and do not reflect processes in place to assure reliability.

Consider the fact that from 2011 through the end of this year, some 36 gigawatts of base load power will have been retired with no discernable adverse impact on reliability. At the same time, new power plants, more renewable capacity,

transmission upgrades, and numerous demand side energy resources will be added to the diversity and reliability of the grid.

This remarkable ability by the electricity sector to adjust to changing market conditions and regulatory expectations demonstrates a fundamental point; that the industry, working together with FERC, state utility regulatory commissions, regional transmission organizations, and independent system operators can meet the Nation's need for reliability.

In a May 15 letter to EPA, the FERC commissioners summarized their role in assuring reliability. They said in part the following, reliability also depends on factors beyond the commission's jurisdiction, such as state authority over local distribution and integrated resource planning. The commission is not seeking to alter this balance.

The commissioners' letter is a reminder that planning for and delivering grid reliability, including the consideration of potential impacts from proposed new environmental rules, is secured through the interaction of multiple parties over time, including those at the regional

and state level, and those actively engaged in markets. The problem with Section 1202 is that it upsets this balance of interest by elevating the role of FERC and NERC in major environmental rulemakings. As the FERC commissioners make clear in their letter, a thorough assessment of the impacts of, for example, the proposed Clean Power Plan, requires the ongoing input of diverse perspectives and expertise.

We have a similar concern with elevating the role of NERC in federal agencies' environmental rulemaking. The fact is that NERC has been overly cautious and consistently pessimistic, also consistently wrong, about the ability of industry and regulators to adjust to changing conditions, including environmental rulemakings. Now, NERC does play an important role by giving voice to a conservative, worst-case outlook as part of a mix of organizations with unique perspectives and responsibilities for reliability, but its views should be considered along with other voices, not granted an elevated role in the environmental rulemaking process. Perhaps a stronger case could be made for Section 1202 if environmental agencies were failing adequately to consider the reliability impacts of their rulemakings, but

there is no evidence of that.

I would like to turn now to a brief discussion of the other sections of the draft bill. Section 1201 includes what amounts to an opt-out for parties found to be in violation of any federal, state, or local environmental law or regulation while operating under an emergency order. Again, there seems to be little, if any, need for such provisions. The Department of Energy has issued fewer than 10 must-run orders, and only once has such an order resulted in a claimed conflict with environmental requirements. That was mentioned earlier today by one of the members of the subcommittee, who noted the Miron Plant, which was the company involved here, but it was later found that the plant had not taken prudent actions that it could have taken to operate in a manner that was in compliance with both DOE's order and EPA's requirements.

Potential hazard inherent in Section 1201 is that it will provide a perverse incentive for utilities to slow their compliance activities. Sections 1204, 1205, and 1206 establish some potentially worthwhile approaches to addressing critical electricity, infrastructure emergencies,

and the loss of critically damaged large power transformers, as well as the need to identify cyber-secure technologies. Again, we think these provisions are well worth serious consideration by the committee.

Section 1207 uses--usefully directs state commissions to consider requiring electric utilities within their jurisdictions to develop plans to increase the utilization of resiliency-related technologies. Unfortunately, Section 1207 then veers off course. By restricting its focus to base load generation, and listing reliability attributes, the section marginalizes the rapidly grown role of renewable generation, storage, and demand side resources.

And finally, as in Section 1207, the capacity market criteria in Section 1208 create the same bias in favor of traditional base load generation, and against a broader portfolio of resources that are increasingly important to capacity markets and, therefore, to reliability.

Environmental Defense Fund believes that there are some worthwhile elements to the draft, especially regarding planning for emergencies and for physical and cyberattacks on the grid. We look forward to working with you, Mr. Chairman,

and members of the subcommittee.

[The prepared statement of Mr. Holstein follows:]

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Mr. {Whitfield.} Thank you, Mr. Holstein.

And thank all of you very much for your patience and staying here with us today. We appreciate your testimony.

You know, these hearings are so enlightening because it is always good to hear divergent views on these key issues. And we have heard the broad spectrum of views on this discussion draft, and it is quite obvious to everyone that the very key to this is base load electricity. And some people want to move away from that, some people want to protect it.

But the question that I would ask is--I will ask you, Mr. Fanning and Mr. Dominguez, to comment on it. Why is--well, let me back up a minute. We have heard a lot of discussion about there is really should no--not be a concern about reliability, and maybe we could agree with that, but I would also point out at this time renewables minus hydro is producing only 6 percent of the electricity in the country. So the fact that there hasn't been a reliability problem to this point is encouraging, but with the mad rush for more renewables, I don't think that we can emphatically say that

there won't be a reliability problem in the future. But why is base load electricity still important, Mr. Fanning?

Mr. {Fanning.} Yeah, thank you, Chairman. As I mentioned before, as CEO of a major company representing 4-1/2 million customers, and let's remember, of the families we are privileged to serve in my area of the United States, fully 46 percent of those families make less than $40,000 a year. And they are making tough kitchen table economic decisions every day. And while there are awfully laudable outcomes from efforts to improve our air and water and other things, I must be accountable to those families by providing a balance of clean, safe, reliable, and affordable energy. We can't let any one of those attributes essentially subvert the other. And when I think about the value of base load electricity, it provides us an avenue to essentially play offense against all the economic and other challenges this great nation faces right now. And I think when we are able to provide for a sure supply of electricity at reasonable prices that will not be volatile, remember, when we think about in finance or in business--

Mr. {Whitfield.} Is that one of the definitions of base

load; not volatile?

Mr. {Fanning.} Yeah, generally. When you think about nuclear and coal and some others, it is--biomass, for example, they have a much more reliable stream of energy profile over time, as compared to the high volatility of natural gas and the intermittency of renewables. So it is really important to balance clean, safe, reliable, affordable.

Mr. {Whitfield.} And one of the things that you point out in your testimony, Mr. Dominguez, that on July 7--I mean January 7, 2014, you went through a litany of outages--forced outages. Is that what you were referring to on base load--the importance of base load?

Mr. {Dominguez.} Yeah. I think we get caught up in the use of the word base load. Let's substitute the word base load for generation that has 3 attributes. It doesn't depend on the weather to work. That would be one criteria in the definition. The second criteria is it has on-site fuel. We don't have to--for a period of time, we don't have to worry about an interstate system to bring fuel to it for its just-in-time operation. And the third attribute I would say is it

provides fuel diversity. Most technologies provide fuel diversity and are important, but the 2 things that base load, the way we have defined it, does is it provides certainty that it is going to be here on August 7 of this year, January 7 of next year, regardless of the weather condition, regardless of whether it is snow or wind or whatever. And it doesn't depend on external sources for fuel. For example, for nuclear, we have 24 months of fuel loaded in the core. That lets the grid operators sleep easy that no fuel interruption--

Mr. {Whitfield.} Um-hum.

Mr. {Dominguez.} --is going to cause an outage.

Mr. {Whitfield.} Well, was it the consensus among professionals in the electric generating business that, in the latest polar vortex, that without the base load, as you described it, that we would not have been able to meet our obligations?

Mr. {Dominguez.} Unquestionably true. And I can tell you in polar vortex 1 and 2, we saved our customers over $125 million by being able to shift fuels from one to another. So the diversity--the value of the portfolio is enormous.

Mr. {Whitfield.} Okay. My time is already running out, but I read all of your testimony. I didn't--there was a couple of them that came in late last night, I didn't get to finish reading those, but I read yours, Mr. Moore, and, Mr. Fanning, I know you also addressed Order 1,000, and we would like to continue some discussions about Order 1,000 and some of the issues that that provides as well.

So at this time, I would like to recognize the gentleman from Illinois, Mr. Rush, for 5 minutes.

Mr. {Rush.} Thank you, Mr. Chairman.

Mr. Dominguez, I want to thank you for your testimony today, and especially your comments regarding the nuclear fleet's contribution as carbon-free base load power.

My State of Illinois is--almost 1/2 of the state's electricity comes from nuclear power. And Exelon recently aid that it has--it may have to prematurely retire up to 3 nuclear power plants in the State of Illinois. And maybe you could take a moment or so to explain or to share with me the effects that--to the ratepayers in my state if this would happen, and if you could also speak to the environmental impact that closing these plants would have on my state.

Mr. {Dominguez.} Sure. Well, I don't think we need to look further than the state reports themselves. In 2014, the Illinois House asked state agencies to consider the economic environmental reliability and cost impacts of losing 3 of the state's 11 nuclear facilities. The conclusions were that, from an economic standpoint, we would lose approximately $1.8 billion in economic activity associated with the employees at the plant, and other economic effects.

The Illinois Commerce Commission commissioned PJM and MISO and also other independent experts to analyze the cost of power increases associated with losing the plants in a supply and demand market. They concluded that the cost on an annual basis would be something like $500 million to $1.2 billion a year.

And then lastly, the Illinois EPA was tasked with asking the question about compliance with upcoming rules around carbon that EPA is working on 111(d). And conclusion was that without the plants, the cost of compliance to Illinois customers could be $18 billion higher over a 10-year period.

So in sum total, they concluded that the cost was about $3 billion a year in terms of customer and economic impacts

associated with the loss of the plants. When you think about these assets, and there is--I heard some questions this morning about assets that are 25 years old, some of these plants are 25 years old, but that doesn't tell the story. They are designed to run for 60 years. They are designed to run up to 80 years, we believe. So simply pointing out that something is old doesn't provide any information if you don't have context around the design life. And the point I am making, Representative Rush, is that these impacts will be felt each year of that remaining design life where the assets are no longer available, because once they are shut down, they don't get turned back on.

Mr. {Rush.} I want to thank--

Mr. {Dominguez.} And we are looking at tens of billions of dollars.

Mr. {Rush.} Yeah, I am running out of time here.

Mr. Moore, Mr. Holstein, from your experiences, in the more than 40 years that EPA has been implementing the Clean Air Act, has compliance with air pollution standards ever resulted in reliability problems?

Mr. {Moore.} The answer is no, Mr. Rush. The answer is

no, it has not. The EPA regulations have worked in coordination with grid operators, reliability authorities, states and others. Order 1,000, as you mentioned earlier, really worth a lot more discussion probably than we have time here for today, but that order really helps create new forums and processes for states and FERC and FERC jurisdictional regions to work together, and help resolve some of those thorny jurisdictional issues. So that is helping now.

Mr. {Rush.} Mr. Holstein, do you agree with the approach taken in Section 1202 that makes it unclear if FERC has the legal authority to delay or block EPA rules if the commission was not able to complete its reliability analysis by the deadlines mandated in this draft?

Mr. {Holstein.} Mr. Rush, as I stated in my testimony, I have many reservations about Section 1202 mostly because, even though it is clearly intended to help ensure reliability, I believe it actually does the reverse because it elevates the views of parties, specifically FERC and NERC, who admittedly have an important--very important role in the reliability--maintenance of reliability. But they don't have the only role, and as they indicated in their letter to EPA,

they stress themselves that a balance must be struck in considering--in providing input to rulemaking agencies such as EPA, and that balance means let's involve actual market participants and the regulators that they work with at the state level. And I think it would be a shame if we elevated FERC and NERC's role to the detriment of the other entities that play such an important role in reliability.

Mr. {Rush.} Thank you both.

I yield back, Mr. Chairman.

Mr. {Whitfield.} The chair recognizes Mr. Olson of Texas for 5 minutes.

Mr. {Olson.} I thank the chair.

In using a term from college basketball, welcome to the elite eight, all of you.

My first question is for our friends at ABB, Ms. Heitman. I appreciate your support for this bill's strategic transformer reserve. I agree this is worth considering. One question I had for you though is on hardening new transformers. You mention in your testimony, and I don't want you to say anything that can be used against those trade secrets, but I would like to ask about that. What are some

things that the next generation of large transformers should be defended against? EMPs, cyberattacks, men with rifles like California, what keeps you up at night, Ms. Heitman?

Ms. {Heitman.} Thank you, Congressman Olson.

We are absolutely committed to developing technology to respond to the resiliency concerns on all four counts that I mentioned; the criminal attacks, extreme weather, GMD, EMP. Some of the things that we are doing that I can share with you today, we are in the final stages of development of a ballistic protection for the transformer itself, as well as shielding and fortifying the critical components and valves of the transformer. We have technology available today for dry bushings. Why dry bushings are so important today, the majority of transformers installed have oil-filled bushings. In a failure mode of any type, which could occur from any of the mentioned threats, an oil-filled bushing actually drops down into the tank and can cause a failure of the transformer itself. Dry bushings on the other hand, we have many videos that you can shoot at a--at the dry bushings, no failure occurs at all, and most importantly, it does not drop down into the tank.

And finally, with remote cooling, we have this technology available to be able to place the cooling at a--in a remote location away from the transformer, and potentially in a secure location.

Mr. {Olson.} And these are all cost-effective steps, correct? They will be supported by the economy, they are not over-burdensome, is that fair to assume?

Ms. {Heitman.} The dry bushings have already been adopted by many utilities--

Mr. {Olson.} Yeah.

Ms. {Heitman.} --and remote cooling was actually adopted by CenterPoint in the recent example of the recovery transformer shipped.

Mr. {Olson.} There we go, the market speaks.

Mr. Fanning, for you, I appreciate your testimony and the conversation about information-sharing. It sounds like the ECC--ESCC is doing a good job, and I would like to delve into where we are in keeping an open line of communication between industry and government. What kind of information is being shared today from company to company, and between companies and government?

Mr. {Fanning.} Yeah, thank you very much for that question. In fact, there was a report given to the Administration, the President, from the National Infrastructure Advisory Council that called out the ESCC as kind of the benchmark for all other coordinating councils to follow. I think there are a number of different reasons why that is, including CEO participation and the fact that in the electricity industry, our genetic material is all about reliability and keeping the lights on, and that really drives the United States' economy.

With respect to the threats, we have put in place standard technologies, software, and information-sharing regimes across our companies, and run then through--you had Gerry Cauley on earlier, this ES-ISAC, where we have now processes in place to assess before the problems occur and take action. And so that has been critically important. Aligning ourselves has been a great step forward. The next challenge will be aligning our other interdependent organizations, including telecom, transportation, water, and the financial systems. It is an enormous effort and it is something we are working on right now.

Mr. {Olson.} A lot of work for this committee, obviously.

Mr. Dominguez, care to comment on that, sir? The--I am sorry, the EEO--what is the acronym here? ESCC.

Mr. {Dominguez.} We also are participating. I think Tom framed it exactly right, I think there is a lot of good work going on and we welcome the conversation going forward.

Mr. {Olson.} We are out of time. The final fun question. I talked about basketball, the elite eight, to open this line of questioning. Ms. Heitman, you are from Houston, Texas; Clutch City, USA. Who will win the basketball tonight out there in Oakland, the Houston Rockets or the Golden State Warriors?

Ms. {Heitman.} I think ABB has no response on that.

Mr. {Olson.} Yield back.

Mr. {Whitfield.} I also want to thank Mr. Olson for raising the issue of dry bushings.

At this time, recognize the gentleman from California, Mr. McNerney, for 5 minutes.

Mr. {McNerney.} Well, I have a projected answer for Mr. Olson's question. I think the Warriors are going to do

pretty good tonight. So, you know, actually--

Mr. {Olson.} Fear the bear.

Mr. {McNerney.} All the testimony was really good. I would love to ask every single one of you specific questions, so thank you for coming out and talking.

I have repeatedly asked my republican colleagues to embrace carbon sequestration because climate change is coming, it is here, and we need to start doing things about it. If we don't, some of the coal-generating facilities are going to be seeing more problems.

Mr. Fanning, you have a project going at Kemper. Could you just give us a rundown on where you are on that?

Mr. {Kemper.} Yeah. Real quickly, you know, people do a lot of rhetoric. There is one company in America doing all the above and it is Southern Company. Leading the United States in new nuclear, we are building 21st Century Coal, that is the one you are talking about. We have made a huge shift in natural gas, one of the leading owners of solar, and big in energy efficiency.

With respect to 21st Century Coal, we have developed out own technology, we are the only company doing robust,

proprietary research and development in our industry. We developed a technology along with our partner, Kellogg Brown and Root, which will take native Mississippi lignite, we will essentially gasify it, and we will be able to strip out the CO2 so that we can produce more electricity with less of a carbon footprint than natural gas. And in this case, the CO2 will not be a waste stream; we will use it to produce more domestic oil production.

Mr. {McNerney.} Yeah, very good. And you are also, as you mentioned, developing nuclear, so you must have done the calculations that that is a positive--

Mr. {Fanning.} Absolutely.

Mr. {McNerney.} Very good. I think I heard you say toward the end of your testimony that the--an unregulated utility market would lead to some problems. Was I right in hearing that?

Mr. {Fanning.} Yes.

Mr. {McNerney.} Okay, good. Could you expand on that little bit?

Mr. {Fanning.} Yeah, easily. I think the only way you can do, and it is one of the reasons why Southern Company is

the only company in America doing a full portfolio of solutions, is there are no price signals in existence today to build new nuclear, for example, in a deregulated market. There are no price signals in existence to build and advance the notion of 21st Century Coal in America in any deregulated market. And, in fact, when you think about the incentives, I mean I will just pull Exelon out, Chris Crane and I, the CEO of Exelon and I agree on this, he is a wonderful friend of mine and all that, but, for example, Exelon would benefit, your bottom line would benefit, from a carbon tax. You produce a lot of your energy from nuclear which emits no carbon, and that is a good thing. A carbon tax would be bad for America, in my view, because it raises the price of energy where America has a global competitive advantage.

So what I get at there is, there are incentives in deregulated markets which reward higher prices. In an integrated regulated market, you are rewarded for lower prices. In a reregulated market, because prices go up during times of scarcity, there are incentives--there are a lack of incentives anyway to reduce scarcity.

Mr. {McNerney.} Right.

Mr. {Fanning.} In my market, in transmission and distribution, we spend about $1 billion a year in the--business.

Mr. {McNerney.} Thank you. I am going to switch you over to transformers. You gave a list--Ms. Heitman, you gave a list of things that would improve the reliability resilience of transformers. It was kind of quick so I wasn't able to write it down. Do you think those items should be identified in the legislation, or some more general way to discuss those?

Ms. {Heitman.} I think that part of them--most of them actually already are identified as far as the need to both harden the existing--the hardening of the existing units I don't believe are--is in the legislation itself. I think that has got to be finalized in development by the industry at this point, but as far as the ability to respond in an emergency situation, yes, I think that is critical. I think the rapid replacement in the case of a damage of multiple LPTs has--is addressed with the recovery transformer program.

Mr. {McNerney.} Okay, thanks.

Mr. Holstein, you--do you see this Section 1208

affecting grid modernization or new technologies being developed for the grid? In other words, you said that this straightjackets the utilities, could you explain that a little bit please?

Mr. {Holstein.} Yes, I think the criteria that are laid out in the section, as I said in my testimony, create a bias in favor of traditional base load generation. And I want to say something about that in just a moment. But at--in so doing, it reduces or marginalizes the role of many of the other tools that are increasingly available to grid planners in order to provide reliability. So I think in that sense, it is counterproductive. But a fundamental point I want to make is that in listening to this discussion, it might be easy to conclude that there is some kind of either/or proposition here; that you are either for base load generation or you are against it. My organization, Environmental Defense Fund, has supported lots of base load generation including license extensions for nuclear plants. So base load is part of it, but we just want to make sure that in legislating for reliability, we don't marginalize the many other tools that are available, including demand side

resources, renewables, et cetera, even if you believe that the contributions they make are not as great as the contributions that base load makes. It doesn't matter. What we are after here is a diverse portfolio and, therefore, because there is this connection, a more reliable grid.

Mr. {McNerney.} Thank you.

Mr. Chairman, I yield.

Mr. {Whitfield.} Gentleman yields back.

At this time, recognize the gentleman from Pennsylvania, Mr. Pitts, for 5 minutes.

Mr. {Pitts.} Thank you, Mr. Chairman. Thank you very much for this very informative and interesting testimony.

Mr. Dominguez, some argue that maintaining base load generation is not critical to reliability, and that such generation can be replaced by simple load shedding and other demand side management strategies. What is the problem with over-reliance on load shedding as strategy for mainlining reliability?

Mr. {Dominguez.} Well, I--you know, I think it almost answers itself. When we are asking or customers to give up the use of electricity to preserve the reliability of the

system, that is okay if it is done on a voluntary basis and the customers can preplan, but if we are literally putting our system in a place where, in order to maintain reliability, we have to involuntarily shut down customers, it is a very dangerous spot for us to be, and on behalf of the 8 million customers we serve, clearly not what they expect from the electric system and the service we provide.

Mr. {Pitts.} Now, you talk about the need to balance reliability and affordability and clean energy, and a lot has been made of the push for more renewables in Europe, and I Germany in particular, how have those policy decisions affected reliability and affordability of electricity?

Mr. {Dominguez.} Well, I think the affordability question has been answered, unfortunately, for German consumers at least. The reliability question is still--still remains. Presently, the rate for electricity in Germany is about 50 cents U.S. per kilowatt hour. That is about three times or better the rate in the Philadelphia area that we serve, Baltimore or Chicago. Many have begun to talk about electricity in Germany as a luxury product. And I think the lesson from Germany was that it moved very quickly into these

technologies without fully understanding the impact on cost for the average consumer. Mr. Fanning talked about the economic issues that face his customers. Our customers face the very same issues. 300 percent increase in rates would be a problem. At the same time the country made a decision to begin shutting down its nuclear assets, which has meant that not only prices increased, but emissions have also not followed the trajectory one would assume through the increase of renewable energy.

So I think there are a lot of takeaways from the European experience. This is a transition that could be managed, but we need to manage it carefully. We need to pay attention to the resources that keep prices low, that keep electricity reliable, and that are working today and could work, and are designed to work, for decades into the future.

Mr. {Pitts.} One thing we learned recently is that in Portugal, which has invested in a lot of renewables and natural gas, LNG, that the market now has caused them to buy a lot more coal and produce a lot more electricity with coal because it is so cheap. I mean the market force is there. You want to comment on that?

Mr. {Dominguez.} Yeah, sure. I mean the situation in Europe is different than the U.S. situation in the sense that shale gas availability has not reached the same proportional level of involvement in Europe. It is a really minimal player, so they still depend on natural gas imports from Russia and from other countries. And so what they have found in Europe is that, to offset the variability of renewables, coal steam generation units do a pretty good job of filling the gaps when the renewables don't operate for environmental reasons. So as a consequence to that, they buy more coal, emissions unexpectedly have increased, notwithstanding the substantial and growing contribution of renewables in these markets.

Mr. {Pitts.} In the minute I have left, you mentioned in your testimony that--the fact that hydro and nuclear power was primarily responsible for keeping a lot of us from losing power during the polar vortex, and that we lost power from natural gas and coal. Why did that occur?

Mr. {Dominguez.} Well, a couple of different reasons. For--as Gerry Cauley mentioned when he was here earlier this morning, what we found is that the equipment wasn't robust

enough to sustain the very severe weather temperatures. And so that took about 1/2--of the 47 percent of natural gas that didn't show up, 1/2 of it was the equipment just didn't work because it got real cold. The other 1/2 was, it was connected to gas pipelines but there were no molecules in those pipelines.

For coal it was a similar story. We saw coal plants that weren't appropriately ready for the weather conditions. But then in addition to that, you have to recognize that a number of the coal plants in PJM require natural gas to start. So if natural gas isn't available, you can't start the boilers and, therefore, you lost the coal plants. That was kind of the story.

Mr. {Pitts.} Thank you, Mr. Chairman.

Mr. {Whitfield.} Gentleman yields back.

The chair recognizes the gentleman from New York for 5 minutes.

Mr. {Tonko.} Thank you, Mr. Chair. Welcome to our witnesses.

Mr. Bergey, in your testimony you indicated that Section 1207 of the draft provides ``a counterintuitive emphasis on

base load generation.'' Some have suggested that adding more distributed generation to the grid could indeed reduce its reliability because of the integration challenges and the variable nature of renewable power. Do you agree with that sentiment?

Mr. {Bergey.} No. I have heard it for 30 years and it hasn't--wasn't true then, it is not true now. In fact, over the last 30 years, the power electronics that are used to interface the variable resources with the grid have gotten much more sophisticated, and they have risen to the degree now that we can provide our support, power factor correction, we can even reduce harmonics that come from your home computer power supply, for example.

Thirty years ago we were told, and there were rules passed that require wind systems, solar systems to go offline almost immediately with any grid disturbance. Now, we are coming full circle and being asked to stay on and help support the grid through short-term disturbances because there is a recognition that this can be done safely and cost-effectively with existing technology. And this is technology that is on the move. We are getting cheaper, more capable,

more interconnected electronics, and the more that those are spread over with solar, wind, storage, and other resources such as that, the rise of micro grids gives us, I think, tremendous capabilities for the future for adding resiliency.

Mr. {Tonko.} Well, with that being said, are you concerned that Section 1207, as currently drafted, may discourage further innovation and adoption of renewable generation, energy efficiency, micro grid, and energy storage technologies?

Mr. {Bergey.} I do have concerns with the way it is written, if that was the question.

Mr. {Tonko.} Okay. Any recommendations on how to improve that?

Mr. {Bergey.} Well, I think, as I said in my testimony, I think elevating base load to a special status is counterproductive; that we should take an all-of-the-above approach. I agree with many of the statements that have been made about the value of base load, and it has an important role. I can't tell you how the transition of the power grid is going to go over the next 30 years, but I can say that distributed generation for certainly--for sure is going to

play an increasing role and give us increasing opportunities. It would be unfortunate if the legislation put a--you know, was more of an anchor than a sail.

Mr. {Tonko.} Um-hum. Mr. Holstein, in your testimony you stated that the capacity market design feature in Section 1208, requiring generation to be available essentially every day for a period of at least 30 days, may put ratepayers at risk of higher costs. Is this because you believe RTOs and ISOs may encourage over-investment in that base load power--

Mr. {Holstein.} I think--

Mr. {Tonko.} --context?

Mr. {Holstein.} Yes, sir. I think--but that is not the only reason. As I indicated in my testimony, if you look at the criteria that are laid out in Section 1208, this is true of Section 1207 as well, but in 1208 with respect to capacity markets, the legislation as it is currently drafted creates a set of criteria, the 30-day limitation, for example, seems especially capricious and unnecessary, and overall, I think it forces this over-reliance on base load, and as I said in my testimony, marginalizes all the other resources that can be brought to bear, not always perfectly, but nonetheless do

play a role, and an increasing role, in bringing about the grid reliability that the subcommittee members are so concerned about maintaining, and rightfully so.

Mr. {Tonko.} And what impact do you think that this would have on energy efficiency and other demand response or management programs?

Mr. {Holstein.} I think it would have a chilling effect for the reasons I have said, because of this imbalanced emphasis on base load brought about by this set of criteria that you can see, looking, for example, on page 40, that really puts reliability and capacity market reliability through capacity markets in a box. And I think that is unnecessarily restrictive, and I would hope that the members of this subcommittee would embrace once again the notion that competitive markets work best, and they work best in providing reliability, just as they work best in providing lots of other things.

Mr. {Tonko.} Mr. Moore, your sense of that? Any comment in that regard?

Mr. {Moore.} I think Mr. Holstein is right, and that as we move increasingly to more renewable energy, base load

generation isn't as effective as bringing the--integrating the renewable energy into the system as other forms of dispatchable generation like some combined cycle natural gas plants. I think it is--one of the things I want to bring out is really a groundbreaking study that General Electric did for PJM, which is essentially the Nation's largest grid operator, last year found--this study found that you could integrate 113,000 megawatts of wind and solar into the PJM grid, that is about 30 percent of total generation, without any additional reliability effects, and with virtually no additional ``backup power.'' So you have those facts, plus the fact that you are burning a lot less coal and natural gas, saving consumers money that way as well and cutting carbon pollution. So you can have an equally reliable grid with a lot more renewable energy in it than we have now.

Mr. {Tonko.} Thank you.

Mr. Chair, I yield back.

Mr. {Latta.} [Presiding] Gentleman yields back.

The chair now recognizes himself for 5 minutes.

Mr. Fanning, if I could ask you. The discussion draft permits owners, operators, and users of bulk power system

facilities to recover prudently incurred costs for complying with an emergency order. I assume you support this, and why would that be important?

Mr. {Fanning.} Absolutely. You know, and the only kind of modification would be this notion of prudent, get to reasonable, but in the time of an emergency, we absolutely need to take the steps necessary to keep the lights on. We don't want to get in an argument about what is required at that moment. Let's get to job one and take care of that.

When I think about the broader, non-emergency conditions in any sort of RTO or ISO, we need to make sure that there are enough mechanisms in place to provide for reliability and balance the notions of clean, safe, reliable and affordable. We need to make sure all that works well.

Mr. {Latta.} Thank you.

Ms.--is it--I want to make sure, is it Haider?

Ms. {Haider.} Haider.

Mr. {Latta.} Thank you. Could you describe some of the reliability and security benefits of innovative technologies such as combined heat and power and waste heat to power?

Ms. {Haider.} Sure. I mean the real benefit of

combined heat and power, which by the way, is an energy-efficiency technology, not a renewable technology, is that it generates heat and electricity from a single fuel source. So by capturing the waste heat from the electric generation, you are increasing your fuel efficiency and eliminating some of that waste. So as I stated earlier, CHP can actually use more than 70 percent of its fuel inputs, so there is an incredible amount of efficiency in the power--in that power and heat generation simultaneously.

Combined heat and power right now is about 8 percent of U.S. generating capacity, so it is actually a fair amount of capacity; 82 gigawatts of installed capacity.

Mr. {Latta.} Thank you very much.

And, Mr. Di Stasio, do you believe that recent and pending environmental initiatives could threatened electric reliability, and if so, are there significant economic trends and factors affecting that grid reliability today that we should be cognizant of?

Mr. {Di Stasio.} Thank you. So I think that people have been focused, as was on the first panel, with the Clean Power Plan, and I would just say that the only difference is,

I would agree with my colleagues that said we haven't had an issue with reliability in 40 years, but there is a cumulative impact over time, and there is also, I would say in the CPP, a much more transformative nature to it because of the significant change in power supply and power flows. That said, our testimony was really intended to be focused generically on the fact that we are trying to seek key federal environmental action, and at the same time trying to modernize the grid. We are adding more digital devices, we are looking to introduce more renewables. All of these things are worthwhile pursuits, but being able to look at them in a prospective way is what we were advocating.

And so relative to Section 1202, while all of the triggering mechanisms and the time frames for studies may not be exactly right as proposed, the point is is that if we took some time to make sure we got it right the first time, we will make sure that, at the end, consumers won't be exposed to unnecessary reliability risks or unnecessary costs, or for doing things in a retroactive manner.

Mr. {Latta.} Well, thank you.

And, Ms. Heitman, if I could ask you just a follow-up

from Mr. Olson from Texas, when you were talking about the LPTs and the lifespan of where we are, because I thought it was interesting, in your testimony you say that, you know, we have some of the units out there being 70 years of age. How--what percent would that be?

Ms. {Heitman.} I am not sure exactly what percentage is greater than 70 years, but the majority of the transformers in the--installed today, according to the DOE report that exists, is 25-plus years.

Mr. {Latta.} Okay, so we don't know right off the bat what would be over 70. It is amazing those things are still in operation.

Ms. {Heitman.} No, I couldn't tell you what percentage is over 70 years--

Mr. {Latta.} Well, they made them quite--

Ms. {Heitman.} --only that they do exist.

Mr. {Latta.} They made them quite well.

I am going to yield back the balance of my time.

And recognize the gentleman from Virginia for 5 minutes.

Mr. {Griffith.} Thank you very much, Mr. Chairman. Appreciate that.

Ms. Heitman, welcome. I want to personally welcome you because, while we don't make the large power transformers in my district, we do make transformers at an ABB plant in Bland, Virginia. So thank you very much for those jobs.

As you were talking about new developments and new products that your company was rolling out, I was seeing jobs coming to an area of my district that can use those jobs in a beautiful county. So we welcome you here today.

You have answered all the questions that I had in your testimony. You have done quite a good job. Is there anything that you wanted to touch on that you didn't feel you had time to cover?

Ms. {Heitman.} I think that we talked a little bit about the rapidly-deployable transformer--

Mr. {Griffith.} Um-hum.

Ms. {Heitman.} --and one of the interesting things about that is I think it works very well hand-in-hand with the government programs and with this new technology. Today, ABB's development of this rapidly deployable transformer that was done in conjunction with DOE, DHS, and EPRI actually allows for a modular transformer to be transported very

quickly from the factory to the utility, but without a reserve production of transformers, this only--the months of production are still required. So when we looked at that development, it only gets us part of the way there, from what we can tell.

Mr. {Griffith.} And that is why you favor the strategic plan to have some extra transformers that are out there for emergency situations?

Ms. {Heitman.} Yes, sir.

Mr. {Griffith.} And it--your--you said this earlier but I just wanted to underline it. Your testimony would indicate those have to be spread around the country so you can get them there quickly, because these units are very large and weigh a lot, and so if you had them all stored in one location, it might--and you had a--say you stored them all in Florida and you had a problem in Washington State, it would take you a long time to get them there, isn't that correct?

Ms. {Heitman.} Well, the interesting thing was we--the test that we had ran was from St. Louis, Missouri, down to CenterPoint in Houston. These units were shipped from the back dock of the factor in St. Louis, and installed and

energized within 5 days, 10 hours, and 10 minutes. And that was with no overtime. So it--we would leave it up to the DOE. We won't make a recommendation on where these should be strategically located, but certainly the closer to the region that they are going to be installed, the faster that could be--but with the design of this deployable transformer, we are talking days and not traditionally weeks of transportation that would have occurred.

Mr. {Griffith.} Yes, appreciate that. And in your testimony, you have just indicated in a number of situations where different agencies were working together and so forth, and I have to tell you all that I support the 1202 provisions. I think they are important for this bill, and I think they are good. And one criticism that was made was it wasn't clear whether or not they gave the authority to FERC and NERC to slow down or stop the EPA. As I read it, it does not, it just makes it a part of the report, but if my colleagues on the other side of the aisle would like clarity, I would be happy to have an amendment drafted that would make it clear that, in fact, a report--that reliability would be affected from either FERC or NERC could actually stop those

regulations, if that is what they want.

Mr. Dominguez, one of the witnesses testified that the mercury rules came into effect on April 16, and while-- nothing dramatic occurred, but your power company doesn't generally have a problem on April 16, it is usually in the heart of winter or the heat of summer, isn't that true?

Mr. {Dominguez.} Yeah, I think, Representative, it is a little early to declare success. What we do know and hope works is EPA has created some safety valve mechanisms in the rule that will allow units that are needed to stay on, to say on. But until we are a few years out, after plant retirements and really see how the system performs through the most extreme weather, I think it is premature to say anything like that.

Mr. {Griffith.} And, Mr. Fanning, your opinion would be the same on that?

Mr. {Fanning.} Yeah. I would just add, I am the Chairman of the Board of the Atlanta Federal Reserve Bank, and I am an Executive of the Committee of the Conference Chair, so the big fed, and I can tell you one of the events that happened between the passage of HAPSMACT, now MATS, in

2016, is an economy that went south in a hurry and demand went way down. And so we have had, if you will, the blessing of a poor economy that has really helped our reliability.

Normally, Southern Company would have added, from a capacity growth standpoint, 900 megawatts a year. Now, we are adding about 400 megawatts a year.

Mr. {Griffith.} Right.

Mr. {Fanning.} So the economy had an enormous influence on the outcomes here.

Mr. {Griffith.} Right. And I do note with some interest that Mr. Dominguez testified that PJM had some significant risks in 2014, and you talked about voluntary versus involuntary requests to stop using power, but in 2015 in my district, there were several occasions when various smaller companies asked their consumers not to consume as much. Is that--and I will ask Mr. Fanning and Mr. Dominguez both, was that your experience in 2015 as well, that there were--while there weren't any dramatic issues, there were issues in your area? Neither one of your companies serves my district, so I am not criticizing your companies.

Mr. {Dominguez.} No, I would say that is consistent.

Look, a lot of our customers sign up to voluntarily exercise demand response, which is withdraw load. And so as part of the protocols as we get up to the edges of the system, we start asking people to actually voluntarily curtail, and they get paid for that, works quite well. But, sure, we have seen that in the last winter.

Mr. {Griffith.} And, Mr. Fanning?

Mr. {Fanning.} Value is a function of risk and return, and the closer we live to the edge of poor reliability, we way increase the risk to the United States economy. And so if return is growing the United States economy, American commerce cannot stay on that kind of volatility.

Mr. {Griffith.} Well said.

I yield back.

Mr. {Whitfield.} Gentleman's time has expired.

At this time, recognize the gentlelady from North Carolina, Mrs. Ellmers, for 5 minutes.

Mrs. {Ellmers.} Thank you, Mr. Chairman. And I want to thank the panel for being here. This has been a really great discussion.

And, Ms. Heitman, I would like to ask you a few

questions. What are some of the steps manufacturers have to take to help address the vulnerability of large power transformers? I know we were discussing a moment ago with Mr. Griffith from Virginia the need to have ready transformers ready to go in an emergency, but what are some of the other things that--from the manufacturing standpoint that need to be done?

Ms. {Heitman.} Yes, the vulnerability of the transformers, we mentioned the old--older and aging fleet in the--in place today, I think the manufacturers can assess and help assess the vulnerability of the existing fleet that is in existence, and then make recommendations around what repairs may be necessary.

Mrs. {Ellmers.} Um-hum.

Ms. {Heitman.} Additionally, there is hardening technology that is under development in order to protect against potential criminal attack in that case. There is modeling that can be done for both GMD and ENP to assess the risk there, as well as putting together programs in conjunction with utilities today in--

Mrs. {Ellmers.} Um-hum.

Ms. {Heitman.} --rapid replace--repair of a damaged transformer, and also employing the technology that was developed on a recovery transformer to rapidly replace a unit once--if it is damaged.

Mrs. {Ellmers.} Wow, you kind of answered all of my questions that I have for you in one fell--so you are very good. And there again, it is very sobering when we think about the age of these transformers, and I know we were talking a moment ago about the, you know, a number of them being 70 years old. I have 38 to 40 years, but basically, you have indicated that 25 year and above age is commonplace, correct?

Ms. {Heitman.} Very average today, yes.

Mrs. {Ellmers.} And, you know, with these--you know, these are implications of needed, you know, resources to be applied, and I can see how that is an issue, and the challenges that exist in relation to that. Can you just designate maybe one or two things what--that can be done in the design and production of a large power transformer that might play into the age and, you know, for instance, when we are looking at the possibility of new transformers, you know,

how long is that process, what can be done, and does it make more sense to really look at those aging transformers and try to revitalize them?

Ms. {Heitman.} I think that--well, I will start with what--why a--why the manufacturing of a transformer is--takes so long. First of all, most of the transformers--large power transformers are customized by utility. So unlike a lot of the other electrical equipment in the substation, which we represent as well as NEMA, the manufacturers that make those, those are more standardized pieces of equipment, as opposed to the LPT--

Mrs. {Ellmers.} Um-hum.

Ms. {Heitman.} --which is designed to the specification of the utility. So the process is, first, a utility is spending--could spend up to a month to design or write the specifications for the specific transformer, then following that there is a 1-month process of the different manufacturers putting together a--doing a design for the quotation of that transformer, followed by a full-out--once that decision has been made as to who is to manufacture that unit--

Mrs. {Ellmers.} Um-hum.

Ms. {Heitman.} --it is almost 3 months in electrical and mechanical design, 3 months in procuring the specialized materials, 2 months in manufacturing and testing, 1 month in traditional transportation, and then 1 month in the installation and commissioning of the unit itself.

Mrs. {Ellmers.} Um-hum. Um-hum.

Ms. {Heitman.} And then what I believe that the manufacturers can be doing to assist in this process is we are willing to assist in technology and also specifications--

Mrs. {Ellmers.} Um-hum.

Ms. {Heitman.} --of a potential reserve program, and whether there is even potential to standardize across that program.

Mrs. {Ellmers.} Um-hum. Thank you so much.

Mr. Fanning, in the provisions--in the discussion draft directing FERC to the study that impacts major rules to make sure we understand the impact of electric reliability, I have a couple of questions in relation to that. In your opinion, who is the best and most unbiased source of information on electric reliability impacts of the rule, and why?

Mr. {Fanning.} The companies themselves.

Mrs. {Ellmers.} Very good. I like that answer. And to that--and, you know, I am just going to move on. You mentioned that the base load provides voltage and frequency support, and we get that, could you explain in more detail what you are referring to, and why base load is so important to it, because I know there has been a discussion that--you know, we have kind of gone back and forth a little bit about reliability and what is available, and in conjunction with the renewables and the increased amount, but why is it so important that we continue to maintain that base load?

Mr. {Fanning.} Well, there--I could give a long answer. I want to give a short answer. It is so important to think about the portfolio of resources, not only nuclear, 21st Century Coal, natural gas, renewables, energy efficiency, each of those has a different cost and energy profile.

Mrs. {Ellmers.} Um-hum.

Mr. {Fanning.} All of those have an important place to play in the whole portfolio. When I think though, you know, we all kind of get wound around the axel in energy policy about clean, safe, reliable, affordable, at the end of the

day, we have to support the livelihood of the United States economy and help these families make tough kitchen table economic decisions every day. And one of the things I applaud, Chairman, about the--this notion of architecture of abundance, that is exactly the right point to follow. That is the principle. And when I think about where America is, not in my lifetime or your parents' lifetimes, we have this opportunity where we can promote energy security, that will promote national security, and that will promote economic security, and give America a chance to regain its status as the premiere economy in the world. It is all those reasons why base load energy capacity must play a part in this Nation's energy future.

Mrs. {Ellmers.} Thank you so much.

And thank you, Mr. Chairman, for indulging me and my time.

Mr. {Whitfield.} Well, that concludes the questions for this panel. I want to thank all of you once again. We have spent the last 3-1/2 hours together. I hope you all had as much fun as we have, but it has been a very important issue that we are dealing with, and we do appreciate the different

views and your opinions on this.

And in conclusion, since you have been here--if there is anyone who wants to make additional comment before we adjourn, I will give you the opportunity. Okay. Okay. That is the end of that.

I would like to ask unanimous consent that the following statements and letters be submitted for the record. You all have seen these, Mr. Rush--

Mr. {Rush.} Yes.

Mr. {Whitfield.} --and you approve of them. A letter on behalf of the American Public Power Association, Edison Electric Institute, and National Rural Electric Cooperative Association, a letter from The Pew Charitable Trusts, and a statement from the American Public Power Association.

Without objection, so ordered.

[The information follows:]

********** COMMITTEE INSERT **********

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Mr. {Whitfield.} So that concludes today's hearing. We look forward to working with all of you. Thank you again very much.

[Whereupon, at 1:32 p.m., the Subcommittee was adjourned.]