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EXAMINING THE STATE OF ELECTRIC TRANSMISSION INFRASTRUCTURE: INVESTMENT, PLANNING, CONSTRUCTION, AND ALTERNATIVES

THURSDAY, MAY 10, 2018

House of Representatives,

Subcommittee on Energy,

Committee on Energy and Commerce,

Washington, D.C.

The subcommittee met, pursuant to call, at 9:46 a.m., in Room 2123, Rayburn House Office Building, Hon. Fred Upton [chairman of the subcommittee] presiding.

Present: Representatives Upton, Olson, Latta, Griffith,

Johnson, Long, Bucshon, Flores, Hudson, Cramer, Walberg, Duncan, Rush, McNerney, Peters, Green, Castor, Welch, Schrader, Kennedy, and Pallone (ex officio).

Staff Present: Samantha Bopp, Staff Assistant; Daniel Butler, Staff Assistant; Kelly Collins, Legislative Clerk, Energy/Environment; Wyatt Ellertson, Professional Staff, Energy/Environment; Margaret Tucker Fogarty, Staff Assistant; Elena Hernandez, Press Secretary; Drew McDowell, Executive Assistant; Brandon Mooney, Deputy Chief Counsel, Energy; Mark Ratner, Policy Coordinator; Annelise Rickert, Counsel, Energy; Jason Stanek, Senior Counsel, Energy; Austin Stonebraker, Press Assistant; Jeff Carroll, Minority Staff Director; Jean Fruci, Minority Energy and Environment Policy Advisor; Jourdan Lewis, Minority Staff Assistant; John Marshall, Minority Policy Coordinator; Tim Robinson, Minority Chief Counsel; C.J. Young, Minority Press Secretary.

Mr. Upton. We are going to get started on time. I just want to let folks know that our committee has a pretty major bill on the House floor this morning, a bill that passed out of committee 49 to 4, on nuclear waste.

I know that debate there has started. A number of us have been there already to speak. And our colleague, John Shimkus, is helping to manage that bill. So I am not sure that he will be back.

But we are expecting votes about 10:45, so I am going to try to be quick with the gavel. And we will continue after that, but it will be a series of votes.

Good morning. Today we are continuing our Powering America series by taking a closer look at a very important but often underappreciated component of our power sector: the electric transmission system.

Ever since visionaries such as Edison, Tesla, and Westinghouse argued the merits of using direct current versus alternating current, the manner and means by which electricity is delivered has been a complicated and, yes, controversial topic.

We depend on our high voltage network of wires and cables to transmit electricity long distances to power everything from our iPhones to our economy. A stable and uninterrupted supply of electricity is critical to ensure the public's health and safety, as well as the quality of life that we have come to expect.

However, in many parts of our country our transmission infrastructure, like our Nation's roads and bridges -- particularly if you are in Michigan -- is aging, congested, and in need of repair or replacement.

Joining us today is a distinguished panel of experts to help us better understand the challenges that the electric transmission sector is facing, as well as the opportunities that may be within.

While much of this debate in the industry is currently focused on generator resilience and fuel security, we cannot ignore the vital role that the Nation's electric transmission infrastructure plays in connecting the electricity producer to the end-use consumer. And as such, I would argue that a resilient and reliable transmission grid is no less important.

Transmission infrastructure, however, does not come cheap, and the planning and construction of new lines often takes years due to permitting and environmental reviews.

Over the past couple of years, public utilities and independent transmission developers have committed over $20 billion annually to upgrade or replace our existing transmission infrastructure.

And while that is good news, creating jobs, et cetera, sustained investment at similar levels will be critical to ensure that Americans have a modern electricity grid that can deliver reliable power at a reasonable cost.

In addition, a predictable regulatory environment and consistent policies regarding how transmission projects are approved and paid for is essential to reduce financial risk and attract new capital.

After we passed the Energy Policy Act of 2005, FERC was directed to encourage investment in transmission infrastructure projects that reduce the cost of delivered power by reducing congestion on the grid.

FERC responded by granting financial incentives to transmission proposals that met certain criteria. And in subsequent years FERC began to issue a series of landmark rules to oversee and regulate the details of how transmission projects are planned, paid for, and ultimately developed.

Order 1000 is the agency's most recent attempt to regulate regional and interregional transmission planning, while also encouraging competition between transmission developers.

However, as we heard from witnesses in our earlier Powering America hearings, while some regional transmission planning processes have become more effective, Order 1000 has all but failed to develop new lines between and among RTOs and other planning regions.

Moreover, FERC's rule allowing merchant developers to now compete against traditional utilities to build transmission projects has been criticized as ineffective for a number of reasons. With the help of our witnesses, we will explore these and other challenges associated with transmission planning, cost allocation, and competition.

Finally, I hope that we can discuss how alternatives to transmission lines factor into the conversation. While high-voltage wires form the backbone of our smart-grid technologies, demand response, energy storage, distributed generation, and microgrids can also provide benefits similar to traditional transmission.

Since these alternatives may improve reliability while

reducing environmental impacts and cost to consumers, we should explore whether any legal or regulatory barriers stand in the way to prevent energy innovation from reaching its full potential.

So we look forward to hearing from our witnesses.

I yield the balance of my time to my good friend and colleague on the subcommittee, Mr. Long from Missouri.

[The prepared statement of Mr. Upton follows:]

******** INSERT 1-1 ********

Mr. Long. Thank you, Mr. Chairman.

I just want to take a few seconds here to personally introduce one of the witnesses that is here today with us, a fellow that I have known since grade school, and fraternity brothers in college, and on through life. And that would be one Mr. John Twitty.

John is the former CEO of City Utilities in Springfield, in my home district, and he now serves as executive director of the Transmission Access Policy Study Group, TAPS.

Welcome, John. And I want to thank you for lending your expertise to this hearing. Welcome to D.C.

Mr. Upton. The gentleman yields back.

I recognize for an opening statement my friend and colleague, the ranking member of the subcommittee, Mr. Rush from Chicago, Illinois.

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

And I want to welcome the witnesses to the hearing today.

Today we will be examining the state of electric transmission infrastructure.

As you know, Mr. Chairman, there have been many developments in the Nation's energy portfolio since FERC issued Order No. 890

back in 2007 as a way to promote open-access transmission services. This rule outlined a planning process for transmission providers consisting of nine planning principles, including coordination, openness, transparency, information exchange, comparability, dispute resolution, regional coordination, economic planning studies, and cost allocation.

In 2011, Mr. Chairman, FERC issued Order No. 1000 as a way to further improve the planning process within and among geographic regions and also to determine how transmission costs were distributed to customers. Order 1000 was also issued to provide additional opportunity for non-incumbent transmission developers to compete to build projects within the service territory of incumbent utilities.

Mr. Chairman, in reviewing this policy it appears that the results have been mixed in regards to how successful it has been in achieving its goals. We are in the midst of a rapidly changing energy landscape, reflected in part by the emergence of renewable energy sources, low-cost natural gas, State-led Renewable Portfolio Standard goals, as well as an increase in energy-efficiency initiatives and overall reductions in energy demand.

Mr. Chairman, shifting consumer behavior is driving many of these changes as customers demand cleaner forms of energy along with new tools to more responsibly use the energy they consume, both as a way to save money and as a way to save the environment.

Traditional methods of buying and selling energy are being disrupted by demand response programs where emerging technologies, such as energy storage and distributed-energy systems, allow consumers to produce energy and sell it back to the grid.

Mr. Chairman, based on the testimony that we will hear today, it appears there are some real concerns with Order 1000, and modifications may be needed to help meet its objectives. If the goal was to provide a clear and collaborative inter- and intraregional planning process, with transparent and fair cost allocations, in order to spur additional competition and increased investment in grid infrastructure projects, then it is less clear if that objective had been indeed achieved.

While most of the witnesses believe that changes should be made, there is less consensus on what those changes should look like.

So I look forward to engaging the panel today, Mr. Chairman, regarding the opportunities and the challenges surrounding

Order 1000, as well as recommendations for improving this policy.

With that, I yield back.

[The prepared statement of Mr. Rush follows:]

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

Mr. Olson. [Presiding.] Thank you.

The chairman of the full committee, Mr. Walden, is not here. So the chair now calls upon the ranking member of the full committee, Mr. Pallone, for a 5-minute opening statement.

Mr. Pallone. Thank you, Mr. Chairman.

I want to welcome our excellent panel of witnesses.

In particular, I am pleased we have Ralph Izzo, the president and CEO of PSE&G here today. Ralph and I have worked together and known each other for many years, and I value his opinion and appreciate the service that PSE&G provides to my constituents and to our State of New Jersey.

The network of transmission lines are truly the backbone of the power system, and these transmission lines are critical to providing reliable electricity. But just like any large, conspicuous infrastructure project, transmission projects are rarely free from controversy. And in densely populated areas, such as we have in the Northeast, allocating space for any new infrastructure is often a challenge.

The electricity sector is undergoing tremendous change. There are new technologies in growth and distributed generation. At the same time, demand for power has remained relatively flat.

And there are new challenges of extreme weather and cybersecurity threats, along with increasing demand for the grid to be more flexible and responsive. And all these things require us to evaluate the policy tools that FERC is using to manage its evolution.

We will hear a variety of opinions today about the degree to which FERC's orders are helping or hindering investments in electric transmission. It is a challenge to get this balance right, so it is no surprise that stakeholders in this arena will have diverse opinions on how to improve these policies.

If we look at the map of existing transmission lines across the country, it is hard for me to believe that we need a lot of new transmission. This is a very mature network. But since much of that network has been in place for decades, it is also a good bet that it needs to be upgraded and modernized.

This something that companies must consider when they are pursuing a transmission project. And a project in my own district, the Monmouth County Reliability Project proposed by FirstEnergy, is one example where there was no serious consideration given to nontransmission options that could make the area's system more resilient and reliable.

It was only through the diligent efforts of a group of my constituents called the Residents Against Giant Electric, or RAGE, that this expensive, unnecessary project is not moving forward.

RAGE provided expert analysis demonstrating that transmission alternatives could be accomplished or an upgrade to the grid at a far lower cost to ratepayers and that these alternatives were never seriously considered. The administrative law judge who reviewed the case in Monmouth County agreed with that assessment.

This project in my home district illustrates that there remains a bias to building transmission rather than using new tools. It is in the financial interest of transmission companies to build, especially when there are clear rules that allow them to recoup those investments.

Determining if new transmission is needed must involve all stakeholders and be evaluated without bias. If, in fact, new transmission lines are needed, and in some cases they will be, then the project should go forward.

But where new technology can provide a cheaper solution that is less disruptive to other businesses, existing infrastructure, and communities, we should ensure that those options are used.

So, again, the rapidly changing environment we are in right

now is both exciting and challenging. FERC's efforts to address transmission challenges have been admirable but far from perfect. There have been and will continue to be missteps along the way that require adjustment and correction, perhaps even serious revision in some areas.

And so I am hoping, Mr. Chairman, that this series of hearings is providing all of us with an opportunity to better understand where the greatest challenges remain.

And, again, I want to thank all of our witnesses, including Ralph Izzo, for appearing today. I look forward to your testimony.

I would yield back the balance of my time to the gentleman from California, Mr. McNerney.

[The prepared statement of Mr. Pallone follows:]

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

Mr. McNerney. Well, I thank the ranking member for yielding. And as a cochair of the Grid Innovation Caucus, I am pleased to be part of this hearing.

I thank the witnesses for their testimony and look forward to working with them to create what the Presidents of both parties have called 21st century electric grid.

Congress needs to address the requirements of an evolving grid, including advances in technology, consumer adoption of distributed generation, and increasing cyber threats to this backbone of American industry.

Just yesterday two bills sponsored by Congressman Latta and myself focused on cybersecurity passed the full committee. This hearing is an important corollary to those efforts. What investments should we be making? What regulatory regime should we be reviewing within FERC or otherwise? And what more should we be doing to modernize our grid?

I look forward to working with each of you to develop practical, commonsense proposals to creating an advanced transmission system.

And I yield back.

[The prepared statement of Mr. McNerney follows:]

This is a preliminary, unedited transcript. The statements within may be inaccurate, incomplete, or misattributed to the speaker. A link to the final, official transcript will be posted on the Committee's website as soon as it is available.

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

Mr. Olson. Thank you.

And there are no more opening statements by members, so now it is the fun time. Our witnesses will have 5 minutes to give their brief presentations. I will work this from your right to your left. And make sure you hit the button and it comes on.

We have a former commissioner of FERC, Mr. Tony Clark, who is now a senior adviser at Wilkinson Barker Knauer.

You are up, Mr. Clark, for 5 minutes.

STATEMENTS OF TONY CLARK, SENIOR ADVISOR, WILKINSON BARKER KNAUER, LLP; EDWARD KRAPELS, CEO, ANBARIC DEVELOPMENT PARTNERS; JENNIFER CURRAN, VICE PRESIDENT, SYSTEM PLANNING, MIDCONTINENT ISO; RALPH IZZO, CEO, PUBLIC SERVICE ENTERPRISE GROUP INC.; JOHN TWITTY, EXECUTIVE DIRECTOR, TRANSMISSION ACCESS POLICY STUDY GROUP; AND ROB GRAMLICH, PRESIDENT, GRID STRATEGIES LLC

STATEMENT OF TONY CLARK

Mr. Clark. Thank you, Mr. Chairman, members of the committee, and Ranking Member Rush. My name is Tony Clark. I am a senior advisor at the law firm of Wilkinson Barker Knauer, which has offices here in D.C. and in Denver, Colorado.

From 2012 to 2016, I had the honor of serving on the Federal Energy Regulatory Commission. Prior to that, I served 12 years as a commissioner and for part of the time as chairman of the North Dakota Public Service Commission. It is a particular honor to recognize my former colleague, Congressman Cramer, and a good friend of many years.

My testimony today centers on a white paper that I recently

authored entitled "Order 1000 at the Crossroads." It offers my reflections on the order, the status of it, and where it might go from there. I have attached a copy of the paper as an appendix to my testimony.

As way of background, Order 1000 was promulgated before I got on the Commission, not long before I got on the Commission, so I didn't participate in that. But I did participate in the many compliance filings that came forward in the wake of the order.

The main thesis of my reflection is that, however well-intentioned the order is, in practice it is falling short of the lofty goals that it set. I suggest that with the passage of a better part of a decade since its adoption, now is an appropriate time for FERC and for Congress, through its oversight authority, to engage in a meaningful assessment of the order.

The paper concludes that one of the paradoxical results of the rule has been that the major transmission projects that many of us thought might come out of Order 1000 actually came out of a pre-Order 1000 world. And in the time spent since Order 1000 was promulgated, there really haven't been a lot of tangible projects that have come through or empirical data to support the success of the order.

The paper concludes that if FERC were to better tailor the rule, especially recognizing significant regional differences across the utility industry, it might have more efficacy.

Put succinctly, we may today find ourselves in the position of having a rule that ensures significant compliance costs, but without a lot of demonstrable benefits coming out the other side.

It is perhaps ironic that many of the most impactful transmission projects that I mentioned, such as in my home region the MISO Multi-Value Project, arose from that pre-Order 1000 world that I talked about.

I suggest that the reason for this is multifold. Some of it is that regions, particularly those that were served by vertically integrated utilities, were already doing a fair amount of planning within their regions prior to the order.

For those regions, Order 1000 replaced that collaborative bottoms-up process with a Federal top-down process where there is a fair amount of bureaucracy that is involved with it. And the name of the game is making sure that you are checking compliance checklists as opposed to actually bringing projects to fruition.

Creating a Federal mandate on top of what was already previously happening with many regions has added time and

complexity. And we have seen in some regions a lot of litigation with respect to the transmission projects.

The electricity landscape has changed dramatically in terms of the resources, technology, and State policies that drive transmission decisions, both since EPAct 05 and Order 890, which preceded Order No. 1000.

And then finally, certain implementation decisions, such as how cost allocation is handled within regions, has altered transmission development models that were previously broadly accepted within a number of the regions.

In short, even amongst those who are broadly supportive of Order 1000, there seems to a widespread sense that something is amiss with it in terms of the underwhelming results that have come out of it.

In light of this, I would argue that it is appropriate for policymakers to consider Order 1000's future given its track record. My paper encourages industry conversations about ways that Order 1000 could be streamlined across the board.

While regional planning conversations may result in some benefits -- and I would add there may be some benefit especially when talking about interregional projects where maybe not as much

conversation had happened in the past -- there may be ways to do it while repealing some of the more prescriptive aspects of the order.

Briefly, moving beyond Order 1000, I would offer that I think there are a number of regulatory policy calls coming up that could have a significant impact on how transmission infrastructure will be developed. FERC has significant decisions ahead it, dealing with issues like rates of return on transmission projects for jurisdictional rates, issues related to transmission incentives that FERC builds into its rate structure.

And, finally, one of big elephants in the room on transmission development is, as it is with pipeline development, it is very difficult to get infrastructure projects sited and brought through the construction phase because of multiple levels of sometimes bureaucracy and red tape that can block some of those permitting decisions.

With that, I conclude my testimony. Thank you. I look forward to any questions you might have.

[The prepared statement of Mr. Clark follows:]

******** INSERT 1-2 ********

Mr. Olson. Right on time. Thank you, Commissioner Clark. Our next witness is Dr. Edward Krapels.

Mr. Krapels. Perfect. Thank you.

Mr. Olson. CEO of the Anbaric Development Partners. Five minutes, Dr. Krapels.

STATEMENT OF EDWARD KRAPELS

Mr. Krapels. Thank you, Mr. Chairman and distinguished members of the Energy Subcommittee.

My name is Ed Krapels, and I am the founder and CEO of Anbaric, which is an independent transmission microgrid storage and smart energy campus developer. We are funded by institutional investors, so we are not your typical utility.

We like to think we build the electric businesses of the future, and the future is very different from the past, as other members have already indicated. We helped to spearhead two high-voltage direct current buried transmission lines between New Jersey and New York. The high-voltage direct current technology is common worldwide, but not widely used yet in the United States.

As a person who has actually developed interregional transmission projects, I have taken the opportunity to write an article that is part of my prepared testimony that was just published in The Electricity Journal called "Triple Jeopardy." It reviews why, even though everyone agrees these kinds of interregional transmission links are useful and that more are needed, both existing and new interregional projects are being choked off by well-intentioned but unproductive regulations.

Some of these stem from Order 1000 and the inability to implement Order 1000 in a way that is sufficiently prescriptive to handle the many issues that arise when interregional transmission projects are proposed.

I am here this morning, however, to discuss a really important new opportunity in our power industry. Federal energy and environmental policy can accelerate what promises to be a once-in-a-generation chance to launch a new domestic industry, and that is offshore wind, if we do it smartly and thoughtfully from the start.

The key to success is to plan, design, and build shared independent offshore transmission, OceanGrids, in a thoughtful way in each of the participating coastal States. The Federal

Government obviously has a huge role in this through the BOEM and FERC procedures that have to be implemented as part of this plan.

Why are these planned and independent OceanGrids so important? Because after years of development in Europe, technology has pushed the price of offshore wind down to super-competitive levels. With that, American offshore wind is now a natural component in the administration's energy dominance strategy. It is indeed fuel from heaven, and its time has come.

However, as with all large-scale energy resources, indeed with any important new industry, the business, financial, and physical platform on which it is built must be carefully designed and developed.

Unfortunately, some ideas about offshore wind would jeopardize the ability to realize its full potential. Early policy proposals in Massachusetts, New York, and New Jersey explicitly would give generators the exclusive ability to own the transmission lines that take offshore wind to market.

These proposals have been promoted by giant, largely European wind developers that would get America's offshore undertaking off on an anti-competitive and wrong footing. It is obviously in their interest to control as much of the access to the onshore

grid as possible.

If we allow that to happen, we will lose the kind of competition that will further lower offshore wind prices. We will lose more fishing grounds because there are more subsea cables than necessary. We will lose control over a substantial portion of our own coast. A proliferation of cables would displace and distress marine life during construction and operations and make it hard to avoid estuaries and navigate sensitive shoreline points of entry. It will undermine an industry in a vital period of its growth.

We are proposing in our OceanGrids a smaller number of large collector stations that are placed at the edges of the offshore wind farms, gathering the electricity from multiple wind farms and bringing it to shore via the minimum number of transmission cables buried in the seabed. These cables would be buried under the ocean floor and sized for multiple wind projects, and it could be either direct current or alternating current, depending on the distance to shore.

If we do it right, we will create an industry and tens of thousands of 21st century jobs. We will create competition between generators. And it is that competition that will bring

the price of offshore wind down to market levels.

I will close by saying that in Europe today offshore wind auctions are yielding prices of 4 to 5 cents per kilowatt hour, which is pretty close to the market price.

Thank you very much.

[The prepared statement of Mr. Krapels follows:]

******** INSERT 1-3 ********

Mr. Olson. Thank you, Mr. Krapels.

Our next witness is Jennifer Curran. Jennifer is the vice president, system planning, at Midcontinent ISO. But most importantly, she is a graduate of Rice University, my alma mater.

Ms. Curran. Go, Owls.

Mr. Olson. Go, Owls.

Five minutes, ma'am.

STATEMENT OF JENNIFER CURRAN

Ms. Curran. Good morning, Vice Chairman Olson, Ranking Member Rush, and members of the subcommittee.

As noted, I am Jennifer Curran, vice president of system planning for the Midcontinent Independent System Operator, or MISO, as we are more commonly known.

I appreciate the opportunity to be here with you today as you examine the state of the Nation's electric transmission system, and I hope the insight into how MISO plans transmission are useful to you as you work to shape U.S. energy policy.

MISO is a 501(C)(4) not-for-profit social welfare organization with responsibility for ensuring the reliability of

the high-voltage electric transmission system to deliver low-cost power to customers. That mission is reflected in our approach to transmission planning. We seek not to minimize the cost of transmission, but rather to identify transmission, which maximizes value to customers in the form of overall lower total energy costs.

The system that MISO manages is geographically the largest in North America. It spans from Manitoba in Canada down through all or parts of 15 States to the Gulf of Mexico.

As you might imagine, a geography that wide presents a lot of diversity in resource types, weather, State policies, and consumer preferences as it relates to electric supply. Transmission is a key tool to optimize that diversity for the benefits of customers.

That diversity also presents challenges as we seek to design transmission plans and, probably most importantly, determine who will pay for them. Even prior to Order 1000, MISO was planning not just for reliability, but also for economics and public policy.

Of the $30 billion of transmission investment that has been enabled through the MISO planning process, approximately 20 percent of that is associated with a long-term regional

planning effort to address the changing resource mix, known as the Multi-Value Projects.

The Multi-Value Project portfolio is a set of 17 projects that are distributed widely across the north and central regions of MISO. They provide benefits of two to three times the cost, predominantly in the form of access to existing and new low-cost energy resources, and reliably enable the renewable portfolio standards in the Midwest.

Transmission like the Multi-Value Projects is a longer-term view. We are about halfway through the implementation of the Multi-Value Projects, with the final project scheduled to go into service in 2023.

In the meantime, as has been noted, we continue to see a great deal of change in the electric industry. So where do we go from here?

I think the challenge in front of us is probably best described by the two questions I get most frequently about transmission planning: MISO, why have you not developed the next set of regional and even interregional transmission? And, MISO, why are you thinking about additional transmission that we clearly won't need?

So that dichotomy is clearly representative of the diversity that I mentioned, and that diversity becomes even broader as we expand beyond the regional boundaries and plan with our neighbors. But it is also reflective of the uncertainty of the future as it relates to electricity.

The MISO planning process uses a scenario-based approach. We try to bookend the potential outcomes of the future and then look for transmission projects that will be valuable in all of those futures.

If we can find transmission that is valuable across that wide range of objectives, then we can feel comfortable that the benefits will continue to accrue to customers and that we can continue to recommend that transmission. We often refer to these as no-regrets projects.

We have a lot of planning to do to determine whether there is a future set of transmission that has benefits in excess of costs and, probably most critically, to come to consensus on who will pay for that transmission, who sees the benefits and believes that the cost they will bear will be in line with those benefits.

Nonetheless, I believe that regional and interregional transmission will be a critical part of the overall solution set

as we seek to ensure the reliability, the efficiency, and the resilience of the electric grid into the future.

Thank you.

[The prepared statement of Ms. Curran follows:]

******** INSERT 1-4 ********

Mr. Olson. And thank you, Ms. Curran. We will talk about Beer Bike and Baker 13 offline.

Our next witness is Dr. Ralph Izzo. He is the CEO of the Public Service Enterprise Group.

Dr. Izzo, you have 5 minutes.

STATEMENT OF RALPH IZZO

Mr. Izzo. Good morning, Mr. Chairman, Ranking Member Rush, members of the subcommittee, as well as full committee Ranking Member Pallone, who has had a long and exemplary career serving the people of my home State, New Jersey.

I am pleased to provide my point of view on the importance of continuing to strengthen and modernize electric infrastructure. Today I will highlight one Federal policy that stands as an impediment to that goal and should be repealed, that being FERC Order 1000.

I am here representing the Public Service Enterprise Group and our subsidiary, PSE&G, a 114-year-old company that is New Jersey's largest electric and gas utility. PSE&G owns around 1,600 circuit miles of transmission operated by PJM

Interconnection.

Despite the fact that PSE&G has been named the mid-Atlantic's most reliable electric utility for 16 years in a row, much of our electric infrastructure is old. While it has helped power the industrial Northeast for nearly a century, in recent years we have had to work to replace, upgrade, modernize, and sometimes move parts of the grid in order to ensure our system can withstand extreme weather events and other threats, for even as our customers are using less electricity, their reliance on it has never been greater.

Of course, we don't have a blank check. Our investments must be prudent. Over the past 10 years we have made improvements that have reduced unplanned transmission outages by over 80 percent. So the customer benefit is clear.

Transmission investment has been helped by Federal policies that have recognized the importance of transmission and the risk in building large projects. However, Order 1000 stands out as a policy that undermines these efforts.

Enacted by FERC in 2011, Order 1000 was touted as landmark reform that would promote efficient and cost-effective transmission planning and remove barriers to development. But in

the 7 years that we have been living under Order 1000, the promised efficiency looks more like confusion, controversy, and chaos.

Regional grid operators have begun to voice their views. PJM CEO Andy Ott last year called Order 1000, and I quote, "a solution in search of a problem that is creating more of a challenge." Southwest Power Pool CEO Nick Brown said it created, quote, "more overhead and more uncertainty."

Our main experience with Order 1000 has been through a competitive solicitation launched by PJM in 2013 for a project to solve voltage issues in southern New Jersey.

To call the process a mess would be generous. PJM made an initial decision and then reversed itself. Disputes cropped up between States and stakeholders that the RTO had to mediate.

PJM found itself having to make judgments outside its expertise, for example, on which alternatives might secure environmental permits or how to interpret the fine print and exclusions when a developer says it will cap construction costs.

Five years into the planning process, we still do not have a constructed project to address a major need on this part of this grid.

And across the country, other red flags continue to appear. No region outside organized markets have even attempted to administer an Order 1000 bid. The Southwest Power Pool spent $5 million on a competitive process for an $8 million project that was deemed unneeded and never built. The California ISO awarded a project to a partnership between a foreign developer and another entity, only to see the developer go bankrupt.

Mr. Chairman, after 7 years these can no longer be called growing pains.

But even beyond the chaotic implementation of Order 1000, there lurks a more fundamental concern. Order 1000 tends to drive short-term, Band-Aid fixes for the grid. Projects that solve multiple problems and provide long-term value tend not to move forward because they are ruled out as being too costly.

Competition is a positive force. But the goals must be set to achieve the outcomes we want. People and businesses depend on an efficient electric system that is resilient for the long-term against an array of very real threats. Leaving Order 1000 in place risks our ability to achieve that end.

Thank you.

[The prepared statement of Mr. Izzo follows:]

This is a preliminary, unedited transcript. The statements within may be inaccurate, incomplete, or misattributed to the speaker. A link to the final, official transcript will be posted on the Committee's website as soon as it is available.

******** INSERT 1-5 ********

Mr. Olson. Thank you, Dr. Izzo.

The chair now calls phenomenon John Twitty. As was mentioned by my colleague from Missouri, he is executive director of the Transmission Access Policy Study Group and a dear friend of Mr. Long.

So offline, you probably have some stories that about him that we would all like to hear. You have 5 minutes.

STATEMENT OF JOHN TWITTY

Mr. Twitty. Chairman, indeed, I do.

Well, good morning, Mr. Chairman and members of the subcommittee. I am John Twitty, executive director of TAPS, the Transmission Access Policy Study Group. Our association has been active here in the Capitol and at FERC protecting the interests of transmission-dependent utilities. We represent municipal utilities, joint action agencies, a rural electric cooperative, and an investor-owned utility, serving about 1,200 utilities with retail customers in 35 States.

As load-serving entities dependent upon the transmission facilities of others, TAPS members recognize the importance of a

robust grid and have long advocated policies to get needed transmission built, but are keenly aware that expansion must be achieved at reasonable cost.

By enacting Section 217(b)(4) of the Federal Power Act of 2005, Congress gave FERC clear instructions on transmission planning and expansion. FERC is directed to facilitate planning to meet the reasonable needs of load-serving entities and enable load-serving entities to secure long-term firm physical or equivalent financial rights for long-term supply power arrangements made, or planned, to meet their service obligations.

These directives translate into steps FERC can and should take regarding transmission planning and investment. But that is not happening to the degree necessary to meet Congress' mandate.

First, the grid have to meet the needs of load-serving entities. Although FERC has established rules for an open and transparent transmission planning process, even FERC has recognized that this is not happening consistently.

We are particularly concerned that transmission-dependent, load-serving entities do not have a seat at the table the way they would if they shared ownership in the grid.

Joint transmission ownership arrangements where all

load-serving entities share ownership of the grid, which have occurred in many States, have a long history of ensuring that the transmission needs of all load-serving entities are met consistent with Section 217.

They also facilitate the State siting process and spread investment risk and responsibility and provide an opportunity for small load-serving entities to offset their increasing transmission rates against transmission revenues, thus reducing cost to ultimate customers.

Second, we need to be sure our investment in new transmission is appropriate consistent with Section 217's focus on the reasonable needs of load-serving entities. TAPS members have experienced rapid increase in transmission cost.

While a portion of the increase is no doubt justified, transmission has become an investment magnet. The potential for guaranteed incentive-elevated returns on equity on low-risk transmission assets may spur investment that is not necessary.

While we support FERC's ground-up consideration of grid resilience, it should not become a blanket justification for excessive investment.

Third, FERC has fallen short in fulfilling Section 217's

directives regarding long-term transmission rights, particularly as to the capacity associated with long-term power supply arrangements on which load-serving entities rely for resource adequacy.

This exposes load-serving entities to increased cost, especially if the RTO choices of large transmission owners have left them with loads and resources in multiple RTOs. It also makes new investments riskier.

Fourth, above-cost incentives are not needed to attract investment. There is no shortage of entities seeking to invest in low-risk transmission assets at FERC's base equity return that is intended to reflect the cost of attracting capital. There is no need for incentive rates of return, much less to expand their availability beyond opportunities provided under current FERC policy.

Those seeking transmission incentives should not be permitted to turn away load-serving entities in the footprint seeking to make their load ratio investment in the grid.

Finally, the transmission planning process can also be a more effective vehicle for inclusive transmission investment. Non-incumbent transmission developers, especially those that

accommodate participation by small load-serving entities, should have a fair opportunity to develop needed new transmission.

Congress should encourage the Commission to reinvigorate the Order 1000 competitive transmission development process in a manner that will promote joint transmission ownership, as well as to use competitive discipline to curb rising transmission cost.

At TAPS, we want to be part of the solution so long as the needs of our customers are met. And I look forward to this discussion.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Twitty follows:]

******** INSERT 1-6 ********

Mr. Olson. Thank you, Mr. Twitty.

Our final witness is Mr. Rob Gramlich.

Mr. Gramlich. That is right.

Mr. Olson. Rob is the President of Grid Strategies LLC.

You have 5 minutes for an opening statement, sir.

STATEMENT OF ROB GRAMLICH

Mr. Gramlich. Thank you very much, Vice Chairman Olson, Ranking Member Rush, members of the subcommittee. I appreciate the opportunity to be here today to talk about the important issue of the state of transmission.

There is no infrastructure more important than transmission, which is essential to the reliable and affordable electricity service we depend on for almost every modern commercial and individual activity.

Since this subcommittee was involved in passing the Energy Policy Act of 2005, the industry has succeeded in building a lot of transmission. Transmission benefits have exceeded the cost by factors of 2 to 3.5 in the major investments in the central region you have heard about in MISO and the Southwest Power Pool.

Transmission investment has enabled over $100 billion of generation investment in rural communities. Transmission investment is needed for both a distributed future and a large utility-scale generation future, either one or both.

We have learned a lot about what works. Regional planning and cost allocation in particular have worked well. We should build on that success. In my written testimony, I provide nine ideas for expanding transmission and improving its performance.

However, none of these ideas matter if there is no leadership at the Department of Energy or FERC. I think we are waiting for that leadership. I fear the agencies are too distracted by misguided proposals to provide life extensions to old power plants. We are all wasting our time comparing different dictionary definitions of reliability and resilience when we should be updating policies for transmission.

If "resilience" is a code word for propping up uneconomic plants, that effort needs to sink on its own poor merits, as my former boss, FERC Chairman and Texas PUC Chairman Pat Woods, said recently.

Turning to transmission. To improve transmission, most of my recommendations are for FERC, but I have some for DOE and Congress

as well. It doesn't matter if it is under the heading of Order 1000, 890, 2000, or an entirely new vision they could roll out called Order 2020. We need to update transmission policy to create the grid we know we will need in the future.

I recommend that FERC and Congress preserve and build upon the twin policies I mentioned of broad regional planning and beneficiary-pays cost allocation. That is what worked in Texas, that is what worked in SPP, that is what worked in MISO. That is what Dr. Krapels described should be done in the Northeast.

Number one, FERC should align transmission owner incentives for advanced transmission technologies. I didn't say more incentives. I am not asking for a subsidiary. I said align the incentives so that transmission owners have an incentive to deploy cost-effective technologies.

Number two, FERC should incorporate advanced transmission technologies into transmission planning. I don't like to call it nonwires alternatives. I think they are just other transmission options. They should all be considered, along with new lines and other assets.

Number three, FERC should fix interregional planning and cost allocation. Clearly, no improvements have been made since

Order 1000's attempt to improve that.

Number four, Congress, the Department of Energy, and FERC should all improve Federal backstop siting. I think it is important for the future grid that we need, and we should make sure it works and is used where appropriate.

Number five, FERC should require proactive planning that captures all of the values of transmission. Too often it gets compartmentalized and not all of the benefits are included.

Number six, the administration should improve Federal coordination and transmission permitting on Federal lands.

Number seven, the Department of Energy should harness the authority and capabilities of power marketing administrations. They can be involved in transmission, they can utilize Section 1222 of the Energy Policy Act of 2005, and help in other ways.

Number eight, the administration should couple the Department of Energy's planning and support for planning and corridor designation with the Department of Interior's efforts to identify renewable energy zones and transmission corridors.

Finally, Congress should consider public financing to right-size transmission. Too often we underbuild for the

resources that we know will be there when our children, their children, and their children's children will benefit from it.

Those resources are there. We know they will be there even in Texas where we built a lot of transmission. We have essentially used up that capacity. And looking back, we would have done better to build it the right size.

I will stop there and look forward to your questions. Thank you.

[The prepared statement of Mr. Gramlich follows:]

******** INSERT 1-7 ********

Mr. Olson. Thank you, Mr. Gramlich.

And for the panel, we are having votes called within the next 10 to 15 minutes, floor votes. We will have to basically go into recess. But until then, we will try to get through as many member questions as possible. We have 5 minutes to ask questions.

Being the chairman, I am first.

And you all know that I am a Texan. And you all know that Texans love to brag about fellow Texans. We say they done something good. They said that in Haskell, Texas.

Haskell is the home of our former Governor, our current Energy Secretary, Rick Perry. He did something good with what is called Competitive Renewable Energy Zones. He used those to fix a problem he had in Texas, a big problem.

We have a lot of wind power, but we have most power out west, rural Texas, where it is not needed. We need it in eastern Texas, central Texas, Houston, Dallas-Fort Worth, Austin, San Antonio.

But that CREZ initiative is part of why, as Dr. Krapels said, Texas leads the Nation in wind power. In fact, one day a couple years ago almost half our energy was provided by wind. Offshore

Corpus Christi, Texas, that wind whips almost 300 days a year. We are making progress on that.

My question is for you, Mr. Gramlich. Can you talk about how the CREZ model worked and whether that is something we could do elsewhere?

Mr. Gramlich. Sure. And you are absolutely right, Congressman, the Texas CREZ model, as well as the ERCOT market structure overall, is a model for the country.

I think we would be doing a lot better in all of the FERC jurisdictional areas if we essentially had the ERCOT market model throughout the Northeast and the rest of the RTO-ISO areas, as well as its proactive transmission planning model that has access to all of that wind and gas resources and others out in western Texas and the Panhandle.

So essentially it is a simple formula of identifying where the generation resources are and proactively building to those resource. The alternative that is too often used in many other places is just to wait one by one for all the little projects to connect, and no one of them are going to build the transmission that are needed. So you need to proactively build and right-size the lines to the resource area.

Mr. Olson. Thank you.

And, Doctor, would you like to add anything, Dr. Krapels, you are the wind expert, about the CREZ model in Texas, how that worked out?

Mr. Krapels. I totally agree. And in the Northeast, we are looking at a wind resource offshore that could be 10,000 to 20,000 megawatts. Texas size, Mr. Chairman. Texas size.

Mr. Olson. That is very big.

Mr. Krapels. That is very big.

Mr. Olson. Huge.

Mr. Krapels. It represents a capital investment opportunity of $30 billion, $40 billion, big even by Texas standards. And yet our transmission policy in the Northeast is the opposite of that of Texas. It is let the generators build and own the transmission, which seems almost insane to me.

We should do what Texas did. We should learn from Texas and build the transmission and plan the transmission first, and then let the generators compete like hell to get access to that transmission. That is what you did, and it works great.

Mr. Olson. This is a great hearing so far.

The last question is for you again, Mr. Gramlich.

You recently wrote a white paper about new technologies that can optimize a transmission system in a much lower cost than building new transmission lines.

Can you briefly describe how that will work and compare that for the cost to the consumer, what the benefits are of your white paper, your plan?

Mr. Gramlich. Yes. Thank you, Congressman, for the question.

I formed a coalition called the WATT coalition, Working for Advanced Transmission Technology. And we put out a white paper where we were thinking, in part, about wholesale customers and thinking we do need more transmission, but we should also make sure that the existing grid is used as efficiently as possible.

And many of these new technologies actually weren't really commercially available when the Energy Policy Act directed FERC to promote them back in 2005. And so there is an unfinished chapter in the implementation of Congress' act, and that is on the operational side, the utilization of the existing wires. A whole lot was done on incentives for new transmission, but nothing was done on utilization.

And so, again, we are not asking for more incentives

necessarily, just alignment of incentives and inclusion into the planning process.

Mr. Olson. Thank you. I am running out of time here.

One question for you, Mr. Clark. I would be curious to know if you think regulators are doing a good job of keeping up with emerging technologies in the transmission or distribution space. Grade A, B, C, D, or something below that.

Mr. Clark. I would say it is incomplete, if that is an answer.

Part of the challenge when we talk about regulators is you are looking at multiple jurisdictions of regulatory authority. So unlike the case of Texas where you have a wholesale regulator that is both the retail regulator and the wholesale regulator, for most of the rest of the country it is very difficult to bridge some of those divides. It is just the way the jurisdictional nature plays out.

FERC has wholesale authority and interstate transmission authority. But many of those other decisions, regarding resource adequacy, integrated resource planning, retail decisions, are made at the State level.

So it is tough to give an overall grade because of the

natural jurisdictional divide that sometimes creates tension.

Mr. Olson. Thank you. My time has expired.

It is now time for Mr. Rush, the ranking member of the subcommittee, to ask his 5 minutes of question.

You are up, sir.

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

Mr. Gramlich, as I mentioned in my opening statement, we are moving into a new energy paradigm where advanced technologies, such as distributed energy, microgrids, and energy storage are increasingly being developed and coming online.

In your opinion, is Order 1000, as constructed, the best way to increase the deployment of these types of low-cost, clean energy resources?

Mr. Gramlich. Sure. Thank you for the question.

We are, indeed, moving toward that future of a more distributed network with many small, sometimes retail or State jurisdictional resources. I think the planning processes need to incorporate that.

I do not agree with those who say that means we are not going to need as much of the bulk power grid. In fact, resources are still often variable and remote, and we need to move the power

around geographically as well as over time, which storage can do.

So we are going to need the big grid, so to speak, and we are also going to need much more coordination at the local level, which is really for State regulators to handle.

I think reliability and efficiency can improve, however, if we bring those distributed resources into the wholesale markets. There are going to be a lot more resources available. And if there are any shortfalls, for example, if we give them access to the wholesale markets, we will have a lot more reliability.

Mr. Rush. Commissioner Clark, in your written testimony you stated that regions that are still served by vertically integrated utilities were already doing a fair amount of regional planning before Order 1000. And you maintain that Order 1000 actually replaced a collaborative, bottoms-up approach to transmission planning with more bureaucracy and a compliance checklist that may not necessarily result in additional transmission developments.

Briefly, what recommendations would you suggest that would help improve Order 1000 to better achieve the goals of better process planning, better cost allocation, and increased competition, including for non-incumbent transmission developers?

Mr. Clark. Thank you for the question, Ranking Member Rush.

What I would do for those, especially those regions of the country where -- which is still the majority of the States -- where the States maintain vertically integrated utilities, I would argue that Order 1000 should be put on a pretty severe diet so that it is slimmed back in terms of trying to leverage those things that were working in the past. And you had indicated or referenced my testimony where I talk a little bit about this.

A lot of the compliance obligations with regard to things like competitive bidding and the process that each of these regions have to go through, through that, don't fit very well in regions of the country that are still vertically integrated. And the reason is because utilities working with their State utility commissions had always done that sort of regional planning in the past. And MISO's MVP projects, suite of projects, was referenced earlier as a good example of how that worked well.

Those type of projects we are not seeing coming forward anymore because now the name of the game is, well, we have to comply with Order 1000, and so it really just becomes a compliance exercise as opposed to the more organic process that happened, bottoms-up.

I think there are some different issues maybe in parts of the country that have restructured where you might have some natural tension between generation and transition as it relates to the marketplace. Even there I don't think Order 1000 is working perfectly, as indicated by some of the examples that Dr. Izzo talked about.

But at the very least in those vertically integrated regions of the country, I think it could be slimmed down from a compliance standpoint. Maybe focus more on some of the good aspects of regional planning and collaboration, and maybe especially on interregional projects where there may not have been as much conversation going on as there was after Order 1000.

Mr. Rush. I yield back.

Mr. Olson. Thank you.

Mr. Long, 5 minutes for questions, sir.

Mr. Long. Thank you, Mr. Chairman, I appreciate you yielding to me.

Mr. Twitty, FERC Order No. 1000 that is being discussed was an effort to introduce market concepts to transmission development. But the scope of transmission completion to date has been severely limited during implementation, forcing American

businesses and households to overspend for transmission projects.

Why is competition in this area so important?

Mr. Twitty. Well, I guess, Congressman -- first, thank you for the question. We all believe that competition brings lower prices and better services. Whether that can happen in a commodity like transmission or, for that matter, other aspects of the electric business I think is still a question out for debate.

I think it is clear that we have to pay more attention to how transmission gets built, how its ownership share is divvied up, what the rates of return are that are provided to the people who are building it. And as I have suggested, there are lots of folks out there who don't have the opportunity to participate in the ownership and in some cases even the planning for these projects.

I would suggest that if you really believe in competition, you really believe in having a grid that is right-sized, that everybody should be at the table. Whether we like Order 1000, the way it was written or the way it has been implemented, is a good question.

Mr. Long. You think it should be reexamined or repealed --

Mr. Twitty. Well, yeah. I don't think there is any --

Mr. Long. -- repealed altogether?

Mr. Twitty. Yeah. No. No. I think there are some good aspects to Order 1000, but I think it is not working the way it was intended. And if more people were part of the planning process, really a part of the planning process, really a part of the ownership structure, I think we would have a better outcome than we do today.

RPTR FORADORI

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[10:45 a.m.]

Mr. Long. According to your testimony, TAPS members in the Southwest Power Pool have seen an average annual rate increase of 17 percent in the last 5 years. That is annually.

A few weeks ago the FERC Commissioner sat at the same table where you folks are sitting today, and I told him that your former employer, City Utilities of Springfield, has studies that show that costs are substantially higher than other customers in the SPP.

What needs to be done, either by Congress or by FERC, to fix this trend of such high annual rate increases for my constituents in Springfield, where you live?

Mr. Twitty. Well, I mention in my testimony the rates of return that are offered by FERC today are pretty attractive. I think we would probably all agree that if we had our 401(k)s and our IRAs invested at those guaranteed rates of return we would be pretty happy.

So I think that needs to be addressed. As I suggested, I don't think there is any need for incentives on top of those

guaranteed rate of return. So I think that is a big piece of it.

And the bottom line, as you mentioned, real customers paying real utility bills, like everybody in the room, pay these increases. And I would suggest that if it wasn't for abnormally low natural gas prices today that are masking lots of these problems, people would be at your doorsteps wanting solutions and they would want them pretty doggone quickly.

Mr. Long. Talking about transparency for a moment here. How would greater transparency in the planning process of transmission building impact the cost of those transmission services?

Mr. Twitty. Well, I guess I think that by transparency we are including a number of things. If we have more people at the table who are actually using the transmission grid, I think it is going to help the right size grid be built. I think it is going to impact the siting process. I think Commissioner Clark mentioned earlier, the siting process is probably the most critical aspect of building any of these kinds of projects.

I have been somebody that has knocked on people's doors asking for rights of way. And I can tell you that if you have mayors, you have elected members of boards of public utilities, for instance, that are part of that process, it is going to be a

better process, it is going to get the right thing built, it is going to be done as quickly as possible, and all of that translates into lower costs.

Mr. Long. You mention in your testimony that grid resilience should not be justification for excessive investment. In our recent hearings, the concept of grid resilience has been described as a crucial characteristic our energy system needs.

Can you explain what you mean by that?

Mr. Twitty. Well, resilience seems to be the word of the day in our business. And there are so many risks, many of them presented through cyber threats, where we need to think about how the grid gets built and how the grid gets put back after an outage.

We would probably all agree pretty easily on what resilience is, particularly those people who have been, like Dr. Izzo, running a utility today.

But we shouldn't let it be the end-all be-all to build something that you can't cost justify. I used to say to our customers, look, we can guarantee your availability 100 percent of the time, but you couldn't afford the service. And then later the engineers would say, well, we probably really can't guarantee it

100 percent of the time.

So it needs not to be an effort to gold-plate the system in the name of "it will never go down."

Mr. Long. Okay. Thank you.

And it is good to see Chris here also today.

So I thank you all for being here. I yield back.

Mr. Olson. Thank you.

Mr. McNerney, 5 minutes for questions, sir.

Mr. McNerney. I thank the chair on this.

Mr. Krapels, your OceanGrid collector stations proposal for offshore wind is pretty interesting. What types of proposals have you seen outside of the New York-New Jersey area, including the West Coast, where we have deep water out there?

Mr. Krapels. Thank you, Congressman.

I have seen and studied very carefully what the European countries have done. So both Germany and the Netherlands are the leaders in offshore wind deployment. And in both of those countries, the idea of an OceanGrid that is separately owned has been part of the policy for some time, and it works very, very well.

In California, I think it would be wise to look at the

offshore in the same way that Texas looked at the upstate. It is a region with unlimited wind energy potential.

Floating storage wind turbine technology is evolving so quickly, I think it will be economic within the next few years. And thinking about this from a grid standpoint, build a grid that maximizes the benefits to consumers, would be the right way to go.

Mr. McNerney. Thank you.

Do we in Congress need to do something such as pushing the BLM's offshore Federal land leasing to be structured so that neighboring wind farms can use the shared infrastructure?

Mr. Krapels. I think that would be extremely helpful. Right now each wind generator can build its own transmission line to shore, but once they do that, that place on shore is occupied by that generator for the rest of time. So thinking it a little bit more holistically would be very wise.

Mr. McNerney. Thank you.

Mr. Gramlich, you mentioned earlier that FERC does not need to grant more incentives, but to better align the incentives that we already have. What are your suggestions on how to go about doing that?

Mr. Gramlich. Thank you, Congressman.

There are examples from other countries that we are currently looking at and trying to work with a number of transmission owners on, as well as FERC staff and others. In the U.K., for example, when there is congestion, the transmission owner has an incentive to reduce that congestion, so thereby the savings are shared between customers and shareholders.

So that concept, I believe, could be applied here in the U.S. It is not an easy task to implement these forms of performance-based regulation, but I am optimistic that with a lot of the best minds from the transmission industry and regulators we can figure it out.

Mr. McNerney. Well, I am kind of interested in the D.C. overlay idea. What would be the next steps to get that to happen?

Mr. Gramlich. Number one, having people like you say that is an important thing to do. So thank you for that. Having FERC and the Department of Energy take interest.

I do think there is a very interesting study that I cited in my written testimony called the Seams Study that a number of national labs are working on that has been partially released, but not fully released.

That will be a great model. So when that comes out, I think

facilitating a dialogue on how do we get that type of grid would be very worthwhile.

Mr. McNerney. Right. Well, you mentioned that there is a lack of private market interest in financing high capacity versions of the line, such as the Texas Competitive Renewable Energy Zones. Public financing to the right size may be appropriate. Can you discuss more about how such would be structured so that we don't build excess capacity needlessly?

Mr. Gramlich. Thank you for that.

Yes, there is always a risk in regulated industries of overbuilding, and you need to think about that. But in this case we know where the resources are, right? The wind resources, the solar resources, geothermal, you name it. These are location-constrained resources that haven't moved over generations and they are not going to move over generations.

I submit we shouldn't be that worried about overbuilding to access those resource areas. Our great, great, great, great grandkids are going to benefit from whatever we do to build out that network.

Mr. McNerney. Interesting.

I am going to yield back in the interest of time, Mr.

Chairman.

Mr. Olson. Thank you.

As a reminder, votes are about to be called. My intention is to alternate between Republican and Democrat until we have to go vote. We will recess for maybe a half an hour or 45 minutes and come back.

The next member to ask questions is Mr. Griffith from Virginia, 5 minutes.

Mr. Griffith. Thank you very much. And in the interest of time, I am going to send some questions afterwards, as we are allowed to do within the next 10 business days, and I will do that.

But I am going to ask one question live, Mr. Twitty, because I represent AEP country in southwest Virginia. And you mentioned that AEP's zonal transmission rate has significantly increased, about 15 percent per year over the past 6 years.

I am wondering if you can explain that to the folks back home. And then answer the question: That is obviously a significant increase for customers in my area. Are there sufficient consumer protections in place to prevent unnecessary investments in the future?

So first explain why it is going up so much, if you can do it quickly, and then what do we need to protect folks.

Mr. Twitty. Well, I would answer it, Congressman, by saying, as I did to Congressman Long, it is too rich an investment for the people who own and build new transmission. It is too rich. We need to reduce returns on equity. We need to make sure we are not providing incentives on transmission investment for a run-of-the-mill, standard transmission line. That is certainly number one.

Number two, as I have said, I think we need more people at the table from the very beginning. Owners of transmission need to let those of us who need the transmission to get their generation to load to be at that table and to own a load ratio share.

These are the people who represent customers, real customers, and if they are at the table, I think they are going to do a lot of good work to make sure that there is no gold-plating, there is not any overbuilding, that we build exactly what it is we need to get generation to load.

It is a long process. It requires your influence on the FERC. It requires lots of people talking about these issues. It is easy to say we want somebody at the table.

If you are a transmission owner, you want to be a transmission owner and do exactly what you want. If there are other voices at that table, it gets a little bit messier. I think you get a better product if that is what happens.

Mr. Griffith. Well, I appreciate that.

And with that, Mr. Chairman, I will yield back so somebody else can get a question in.

Mr. Olson. Mr. Johnson, Mr. Long, Mr. Cramer, anybody want to question, yield, take the time?

Mr. Johnson you are recognized.

Mr. Johnson. Thank you. Thank you, Mr. Chairman. I will make these quick.

Mr. Clark, you know, one of the primary objectives of Order 1000 was to promote interregional transmission development. But there is broad consensus that Order 1000 failed to achieve that goal.

So in your opinion, how could this objective be achieved?

Mr. Clark. Sure. I think part of it is, Congressman, and thank you for the question, part of it is, as I said, attempting to focus in on what you are actually trying to accomplish in the rule. The rule itself is expansive, it ran several hundred pages

long, the compliance filings are probably thousands of pages on top of that.

And I think part of the reason that you get that result is the order tried to do a lot of things all at once. It was partly competition policy. It was partly an investment policy. It was partly a regional planning policy. It was partly a cost allocation policy. Some of it dealt intraregional things, some of it interregional things.

And when you push that much out in a rule and expect the regions to do something with it, you end up with, in my opinion, just a lot of bureaucracy and checking compliance boxes.

That is why I say I think putting the order on a diet and trying to focus in on what you are really looking at doing probably would be the most helpful thing. Some of it may be reinforcing some of the planning conversations that happen, but without the more prescriptive elements of it.

And I think part of it might be focusing more on the issue of interregional projects as opposed to spending a lot of time within these regions having to vet through and try to manage the type of intraregional projects that were happening organically prior to the order itself.

Mr. Johnson. Okay. What would be the advantages of greater interregional transmission?

Mr. Clark. Because you have an interconnected grid, both in the West and in the Eastern Interconnect, there may be certain projects that serve a broad regional benefit that have benefit that accrues to many times over.

But if you are only looking within your region, you might not see the value of the benefit of those particular lines. Some of them could be reliability lines. Some could be market efficiency lines.

But some sort of process to have a yardstick to compare the interregional type of projects might be valuable, and that may not have been captured in earlier FERC orders such as 890.

Mr. Johnson. All right. Thank you. I yield back.

Mr. Olson. Thank you, Mr. Johnson.

Ms. Castor, 5 minutes, ma'am.

Ms. Castor. Thank you, Mr. Chairman.

Thank you to all the witnesses who are here today.

We recently in the Oversight and Investigations Subcommittee had an oversight hearing on the state of the grid in Puerto Rico. I want to thank the committee for continuing to focus on our

neighbors in Puerto Rico.

Unfortunately, right after the Army Corps of Engineers and DOE testified that they thought they had things on track, they had a major outage again.

So I would like to ask you all after to supplement the record with any recommendations moving forward there. Clearly, there is an issue on transmission and the need for microgrids and more resiliency there.

But as we work to modernize the grid everywhere and deal with the cost of the changing climate and building greater resiliency, we need to make sure we are taking advantage of nontransmission alternatives, such as microgrid, distributed energy resources, and energy storage.

Nontransmission alternatives not only have significant environmental benefits, but they can help prevent long-term area-wide blackouts after natural disasters, like we saw in Texas and Florida and Puerto Rico this summer.

We also need to be focusing on the needs of consumers and be a lot smarter. These nontransmission alternatives can be a great benefit to consumers. FERC Orders 890 and 1000 recognize the benefits of nontransmission alternatives, requiring regional

transmission plans to consider whether nontransmission alternatives can more efficiently, cost-effectively, meet the needs of a region.

But despite all these benefits, these alternatives are not being utilized to the extent they should be, especially given how advanced the technologies have become.

So, Mr. Gramlich and Mr. Twitty, do you think that if there was a stronger FERC order that required more than just consideration of alternatives, we would see greater use? And what are the barriers to broader deployment and utilization?

Mr. Gramlich. I do. Thank you for the question.

For reliability and resilience, you can improve both by better monitoring and control of the infrastructure. It seems obvious. We do it with just about every other form of infrastructure with better monitoring and control systems and computing power. All through our economy we have these opportunities to monitor and control better, and that helps with reliability as well as efficiency.

So transmission is no different. The only problem is, it is a regulated industry, the incentives, as I said, are misaligned, and the planning requirements are not up-to-date with the new

opportunities we have.

Ms. Castor. Mr. Twitty, short answer.

Mr. Twitty. Congresswoman, thank you for the opportunity to respond to that. I would certainly agree with those comments.

And I would suggest, as somebody who used to have responsibility for keeping lights on, at the end of the day that is the most important thing that all of us are after.

Technology is a wonderful thing. It marches along. And yet implementing it in the real world, getting the right kind of investment at the right time, is always going to be critical, and making sure it works as it relates to the total grid.

It is one of the challenges today of intermittent resources. Wind and solar are wonderful, and we are all trying to figure out ways to harness them properly. But when the wind doesn't blow or the sun doesn't shine, it is a real challenge.

So you have to have a system designed that can take this intermittent resource, and in the case of microgrids sort of turn over control of a part of your grid to others. And for people, again, like Dr. Izzo, who have responsibility for keeping lights on today, that is a pretty nervous things, because if it doesn't work properly, if the technology isn't fully baked, lights go out

and --

Ms. Castor. Highlights the importance of planning and investments. Thank you so much.

Mr. Twitty. Exactly.

Mr. Olson. Thank you. And seeing there are no further members wishing to ask questions, I would like to thank our witnesses again for being here today. Thank you. Thank you. Thank you. Much obliged.

Before we conclude, I would like to ask unanimous consent to submit the following documents for the record: a letter from GridLiance and a letter from WIRES. Without objection, so ordered.

[The information follows:]

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

Mr. Olson. And pursuant to committee rules, I remind members that they have 10 business days to submit additional questions for the record. I ask that the witnesses respond within 10 business days upon receipt of the questions.

[The information follows:]

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

Mr. Olson. Without objection, this subcommittee is adjourned.

[Whereupon, at 11:04 a.m., the subcommittee was adjourned.]