

U.S. Senate Committee on Energy and Natural Resources
September 26, 2017 Hearing: Pending Nominations
Questions for the Record Submitted to Mr. Bruce J. Walker

Questions from Ranking Member Maria Cantwell

Question 1: Relief for Puerto Rico

Based on your experience in New York, what can the whole of the federal government do immediately to help restore power to Puerto Rico as quickly as humanly possible? What should DOE do to use this internal expertise and manpower to help remedy this desperate situation?

Answer: The hurricane damage to Puerto Rico is tragic. Restoring power to the island is of the utmost importance as it is necessary for the basic needs of its residents. It is DOE's responsibility to do all that it can to help the people of Puerto Rico, and if confirmed, I will get to work immediately on this task and make it my top priority. Having a full leadership team at the Department - so that the Department can focus all of its available resources at restoring power to Puerto Rico - would be extremely helpful.

Question 2: Grid modernization

One of the Office of Electricity's most important roles is integrating new technology and the transmission and distribution sides of the grid. What unique role do you think the Department can play, whether as a clearinghouse of information or funding demonstration programs, to help the country modernize our grid?

Answer: One of Secretary Perry's goals at the Department is to prioritize the modernization of the electric grid. If confirmed, I will ensure that the Office of Electricity Delivery and Energy Reliability is focused on modernizing and improving the grid. I will also utilize the national laboratories and their expertise and research on this important issue.

Question 3: Apprenticeships

With an aging workforce and looming retirements, the energy industry faces a skills gap. Apprenticeship programs can help fill this gap, recruiting workers who earn while they learn. But training is not keeping pace with retirements. In Washington, 8 percent of utility workers are apprentices, but 18 percent of workers are expected to retire by 2018. Will you work with industry, organized labor, and community colleges to expand the use of apprenticeships in energy workforce training?

Answer: A sound workforce is critical for stability in the energy industry, and I know this is an important issue to you. It is also important to me. If confirmed, I look forward to getting more input from you and your staff, and seeing what capabilities the Department has to help address this important issue.

Question 4: Cybersecurity

How will you help protect us from Russian attacks, and how can cybersecurity be a top priority if the administration cuts funding by 32 percent?

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Answer: Cybersecurity is vital to the nation's security. The people of this nation entrust the Federal government to help keep the grid and government systems safe from people and countries who seek to harm the U.S. If confirmed, I would immediately request cybersecurity briefings, and work with Secretary Perry, as well as other relevant agencies and the private sector, to identify strengths and focus resources on areas where improvements could be made. I would also work with your staff to review DOE authorities approved by Congress in the FAST Act for way to fully implement and improve those authorities.

Questions from Senator Ron Wyden

Question 1: Mr. Walker, energy storage is one of the most rapidly growing energy technologies out there, and it can provide multiple benefits to the grid, including enhanced grid reliability. Yet, many energy storage technologies are still in their infancy, requiring further research and development, which historically requires a significant governmental role. Do you support increasing funding levels at the Department of Energy (DOE) for energy storage research, development, and demonstration?

As the Assistant Secretary in charge of energy reliability, would you continue to push the development of energy storage to enable more efficient use of a variety of energy source as a means of ensuring a reliable grid? Will you commit to partner with the private sector to deploy clean energy game-changing technologies?

Answer: Energy storage is a crucial component of a reliable grid. The ability to store energy means we have the flexibility to strategically deploy renewables, among other things. This could lead to lower energy costs by increasing efficiency. I commit to working with all stakeholders on the early-stage development of these transformational technologies.

Question 2: DOE's Office of Electricity Delivery and Energy Reliability oversees regional smart grid demonstration projects. Let me tell you about a highly innovative project which has demonstrated transactive energy management, a promising, cost-effective way to integrate variable renewable energy, energy storage and demand response at scale. The Pacific Northwest Smart Grid Demonstration Project is a successful public-private partnership involving 17 organizations across five Northwest states.

PGE, an investor-owned utility that serves more than 821,000 customers in northwest Oregon, is one of 11 electric utilities from five Northwest states that are participating in the five-year, \$178 million regional smart grid project that was launched in 2010. About half of PGE's \$23 million involvement in the project was paid for with DOE funds, including the \$10 million Smart Power Center. I'd like to hear some support from you for good projects like this.

As the Assistant Secretary in charge of drive electric grid modernization and resiliency, can I expect to see more innovative projects like the Pacific Northwest Smart Grid Demonstration Project?

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Answer: If confirmed, I commit to utilizing the private sector and working together on grid modernization efforts when appropriate.

Question 3: I am currently thinking about the “next big things” in the energy and energy efficiency sectors. For instance, I am very curious about the potential to extract savings from the efficiencies generated when devices and buildings become connected and those connections optimized. This is commonly referred to as “systems efficiency” and it has applications in building energy codes, appliance and equipment standards, workforce development, and the various research activities underway at DOE. What do you think is the potential at DOE, across the federal government, and in states to capture these savings and deliver greater benefits to homeowners, consumers, and businesses? What are some barriers that we in Congress could consider removing to unlock even greater savings?

Answer: I believe this falls under the jurisdiction of the Office of Energy Efficiency and Renewable Energy; however, there is vast potential for improvement. If I am confirmed, I look forward to working with DOE staff and your staff to identify any barriers Congress could consider removing.

Question 4: Right now, we are in the middle of a natural disaster across the American West: the burning of over 8.44 million acres of forests. Governors across the West have declared states of emergency, with the evacuation of towns and homes, and the loss of businesses. What role do you see the Trump administration’s DOE should have in fighting climate change? How would you incorporate predicted climate changes into your preparation and response to significant events like hurricanes or wildfires?

Answer: If confirmed, I will help the Department implement its policies in accordance with the law. Following Hurricane Katrina, I helped develop a Corporate Coastal Storm Plan based upon the lessons learned from the hurricane. Planning for worst case scenarios in storm plans for our critical infrastructure helps maintain the integrity of energy systems.

Question 5: Mr. Walker, our electricity grid--once touted by the National Academy of Engineering as the single greatest engineering achievement of the twentieth century--is in need of serious help. Can you commit on working to modernize our electric grid? If so, what steps will you take to advance grid modernization?

Answer: Yes. If confirmed, I commit to being fully briefed on current initiatives at the Department to modernize the electric grid. I will work to ensure that the Office of Electricity Delivery and Energy Reliability is focused on modernizing and improving the nation’s electric grid.

Question 6: What specifically would you do at the DOE to protect the electricity grid--and American citizens--from cyberattack?

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Answer: As the Sector-Specific Agency for energy sector cybersecurity, DOE serves as the lead agency for protecting the grid. If confirmed, I look forward to continuing DOE's ongoing efforts and to working with the private sector on improving the security and protecting our grid from attacks. There is significant work being done in this area across various federal agencies that I need to be briefed on in order to specifically define a course of action. If confirmed, I would also engage our national laboratories and their expertise and research on this important issue.

Question 7: Considering the integrity and security of the nation's electricity system, as well as the efficiency with which smart-grid enabled appliances and equipment are deployed in the market, do you believe it would be useful to promote open interoperability standards for smart-grid enabled technology? And if so, how would you recommend doing so?

Answer: If confirmed, I look forward to receiving briefings on this issue and working with your office to see how we can achieve a viable solution. It is important to balance the benefits of open source standards with the challenges of physical and cyber security.

Question 8: Utility data access is important for many businesses capable of providing services to consumers, such as enabling more accurate modeling and forecasting of locational electricity demand needs. What is your view on utility data access, and how would you work to make sure both sides of this debate get a fair shake?

Answer: I value the opportunity to participate in discussions focused on data access and will ensure, if confirmed, that it receives appropriate attention especially as it is important for a complete discussion regarding an "all of the above" generation portfolio.

Question 9: Mr. Walker, I'm sure you realize that energy storage and an increasing number of aggregated distributed energy resources (DERs) can provide a range of valuable services to the electricity grid, such as frequency regulation and capacity. In many parts of the country there are no means for remunerating these technologies for the services that they provide, which creates a market distortion against these technologies. What will you do at the Department of Energy, and in your relationship with the Federal Energy Regulatory Commission, to ensure that the full suite of technologies are identified for the value-streams they provide to the grid? For example, would your DOE continue working to better define the value different services the grid can provide?

Answer: Like Secretary Perry, I support an "all of the above" energy strategy. I believe that an "all of the above" energy generation portfolio is beneficial to the electric grid and supports the grid's resiliency and reliability. Traditional baseload generation plays a vital role in the resiliency and reliability of the grid, as well. If confirmed, I will promote the utilization of all our energy sources and follow all laws set by Congress.

Question 10: Electric vehicles (EVs) have come a long way. The problem is that we're talking about two very separate, siloed industries with very few interconnections. With more EV-grid integration, it's possible for EVs to even provide valuable services back to the grid when needed.

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What can we expect from you in supporting further electric vehicle-grid integration, and in facilitating dialogue between US automakers and electricity companies?

Answer: It is my understanding that the Department's budget includes early-stage R&D to enable next-generation combustion vehicles and electric vehicles. If confirmed, I will work appropriately with the Office of Electricity Delivery and Energy Reliability on EV integration. I will also work to utilize the expertise of US automakers and electricity companies where appropriate.

Questions from Senator Bernard Sanders

Climate Change

Question 1: President Trump has suggested in the past that climate change is a hoax. Is the President correct? Is climate change a hoax?

Answer: I believe that the climate is changing. However, the relationship between climate change and human impact must be carefully weighed when jobs, national security, reliable and affordable energy are at stake.

Question 2: Do you agree with the vast majority of scientists that climate change is real, it is caused by human activity, and that we must aggressively transition away from fossil fuels toward energy efficiency and sustainable energy like wind, solar, and geothermal?

Answer: I agree humans may have some effect on climate and if confirmed I look forward to working with you and all stakeholders to further implement an “all of the above” fuel generation portfolio.

Question 3: Do you agree with the vast majority of scientists that the combustion of fossil fuels contributes to climate change?

Answer: I agree humans may have some effect on climate and, if confirmed, I look forward working with you and all stakeholders to further implement an “all of the above” fuel generation portfolio.

Question 4: If confirmed, how will you work to address climate change?

Answer: If confirmed, I look forward to working with you, Congress, and all stakeholders to implement an “all of the above” fuel generation portfolio.

Fossil Fuels

Question 5: If confirmed, how will you lead the Office of Electricity Delivery and Energy Reliability in a way that will reduce the extraction and use of fossil fuels?

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Answer : If confirmed, I look forward to being more fully briefed on all of the tools available within the Office of Electricity Delivery and Energy Reliability and using those tools in a thoughtful manner to implement an “all of the above” energy strategy.

Question 6: How do you see storage and other new technologies supporting electric reliability to allow for the U.S. to reduce the amount of fossil fuels that we use to support our energy needs? If confirmed, how will you support new, clean reliability technologies?

Answer: If confirmed, I look forward to being more fully briefed on how the Office of Electricity Delivery and Energy Reliability can stimulate energy storage technologies to support a diverse fuel portfolio.

Question 7: What do you believe are the best current and prospective electricity delivery and energy reliability policies to effectively reduce carbon pollution from energy development and use? If confirmed, how will you ensure the Office of Electricity Delivery and Energy Reliability supports these policies?

Answer: If confirmed, I look forward to being more fully briefed on delivery and energy reliability policies, reviewing those policies, and working with Congress to implement an “all of the above” energy strategy.

Energy Future

Question 8: What do you believe is the role of renewable energy in our energy future?

Answer: Renewable energy has a role in our energy portfolio, and I believe it should have a role in the nation’s energy future like all of our nation’s energy resources.

Clean Energy

Question 9: Vermont is a leader in clean energy innovation and jobs, from companies that assemble solar arrays to firms that specialize in making homes and businesses more energy efficient. In Rutland, Vermont, Green Mountain Power’s (GMP) Stafford Hill solar and battery storage project is the first of its kind in the nation. This project is saving Vermonters money: on a hot summer day in 2016 when demand was very high, the project saved customers approximately \$200,000 during a single hour. Instead of buying expensive peak electricity from the regional grid, GMP was able to use the electricity generated by the solar farm and stored in the batteries. The State of Vermont set a goal of 90 percent clean energy by 2050. How will you support Vermont’s efforts to achieve a clean, reliable electric grid?

Answer: If confirmed, I look forward to being more fully briefed on the appropriate role the

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Office of Electricity Delivery and Energy Reliability could have to help Vermont achieve its goals.

Question 10: If confirmed, what specific actions will you take as Assistant Secretary of Electricity Delivery and Energy Reliability to ensure low-income communities, communities of color, and tribal communities have access to reliable, clean energy?

Answer: If confirmed, providing reliable and affordable energy to all Americans will be a top priority.

Question 11: Electricity costs represent a disproportionate share of the household spending of low-income households, as pointed out by DOE's Quadrennial Energy Review. What specific actions will you take to ensure that DOE programs, technical assistance, and regulations provide low-income households with access to affordable clean energy so that they do not bear a disproportionate burden of investments in the power system?

Answer: Providing affordable electricity to all Americans is important and, if confirmed, I will work to keep consumer prices affordable and energy reliable for all.

Question 12: Secretary Perry requested a study to ascertain whether wind and solar power are threatening electric grid reliability. The study found no such threat. Do you agree with the science that demonstrates wind and solar can in fact improve reliability while decreasing costs?

Answer: I support of an “all of the above” energy strategy that includes wind and solar, and believe we should support all energy resources for reliability and a resilient grid.

Question 13: Several of my colleagues and I recently introduced the 100 by '50 Act to lay out a roadmap for the United States to transition away from fossil fuels and toward 100% clean and renewable energy. This bill includes major investments in clean and renewable energy as well as in energy storage and grid infrastructure to ensure reliability and affordability. If confirmed, do you commit to supporting investments in grid infrastructure to ensure our clean energy future is achieved in a way that ensures electricity reliability? If so, what specific steps will you take as Assistant Secretary of Electricity Delivery and Energy Reliability to move us closer to this goal?

Answer: If confirmed, I commit to following the laws enacted by Congress and the President.

Question from Senator Debbie Stabenow

Question: Mr. Walker, as Ranking Member of the Senate Committee on Agriculture, Nutrition, and Forestry, I am all too familiar with the energy and electricity challenges facing rural communities, especially related to transmission and affordability.

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In the past, the Department of Energy has partnered with the Department of Agriculture (USDA) to, for example, improve energy efficiency in rural areas. If confirmed, would you extend and build on these partnerships with the USDA to improve rural electrification and tackle the issue of energy affordability in our rural communities?

Answer: Rural areas often have several challenges in the energy sector, including energy affordability. If confirmed, I commit to work with your staff to more fully understand the challenges faced by our rural communities. I will also commit to looking into and understanding what federal partnerships the Department is currently undertaking to address rural electrification.

Questions from Senator Al Franken

Question 1: I believe that energy storage will transform our electric grid. Not only can efficient and effective energy storage systems improve the reliability and resiliency of the grid, but these technologies also allow increasing amounts of variable renewable energy sources to reach the market. That's why I worked with the Chair and Ranking Member to authorize an additional 50 million dollars for energy storage research and development through the Office of Electricity in the Senate Energy Bill. What role do you see energy storage playing in the electric grid in the future? And if you are confirmed, how will the Office of Electricity help advance energy storage?

Answer: I do believe storage can play an important role in strengthening the grid, which is one of Secretary Perry's priorities. If confirmed, I look forward to working with him, others at DOE, Congress, and the private sector to find ways to make storage work for the grid.

Question 2: President Trump's budget guts funding for research and development across the government, putting at risk our international competitiveness and innovative edge. This is especially pronounced at the Department of Energy. His budget slashes energy research programs by \$3.1 billion, including a 48 percent decrease in the Office of Electricity. Are you confident that these budget cuts would not detract from American competitiveness in energy innovation, and if so, why?

Answer: The President's budget focuses the Department's priorities on early stage research and development. It is important to focus on the development of innovative technologies, tools, and techniques to modernize the distribution portion of the electric delivery system - the infrastructure that takes power from the transmission system and delivers it to individual businesses and homes.

Question 3: I am concerned about the physical security of our grid. In 2013, an armed attack severely damaged 17 large transformers at the Metcalf substation in California. Fortunately, this incident did not cause outages. However, it exposed a great risk because transformers are extremely difficult to replace in a short time span. This is because large transformers take a long time to manufacture; they are heavy and hard to transport; they must be customized for each

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substation; and we import most of them from other countries. I think policymakers need to be thinking about this, because if there were a large-scale attack that destroyed a significant number of transformers we would have no way to quickly replace them. Do you believe that there is a federal role to ensure we have adequate transformer supplies if there is an attack on substations? Do you believe that a national strategic transformer reserve is necessary?

Answer: Grid resiliency and security is a matter of national security and are some of Secretary Perry's top priorities. The federal government currently works with the North American Electric Reliability Corporation (NERC), and industry to improve programs such as Edison Electric Institute's Spare Transformer Equipment Program. If confirmed, I look forward to being briefed further on this issue. The risk to critical infrastructure from physical attack is high and needs to be addressed through various means that I will, if confirmed, further investigate and seek to implement.

Questions from Senator Mazie K. Hirono

Question 1: As recently as a decade ago, Hawaii relied on imported fossil fuels for over 90 percent of its energy production. Thanks in large part to a memorandum of understanding first signed in 2008, the DOE has been a key supporter of Hawaii's efforts to shift towards sustainable, locally produced, renewable sources of energy. Hawaii set a goal of 100 percent renewable energy by 2045. In 2016, Hawaii got 26 percent of its electricity from renewable sources, and the Big Island of Hawaii currently averages above 50 percent renewable electricity. As the Second Installment of the Quadrennial Energy Review noted, Hawaii is "currently experiencing the bulk system frequency stability impacts that mainland U.S. power systems will experience in the coming years and decades." DOE renewed the memorandum of understanding with Hawaii in 2014. Will you commit to supporting DOE's continued assistance to Hawaii with research, technical assistance, and grants where appropriate to help Hawaii inform the nation on how to integrate high levels of renewable power sources?

Answer: If confirmed, I will commit to thoroughly reviewing the Office of Electricity Delivery and Energy Reliability's research, technical assistance, and grants that impact Hawaii.

Question 2: Twenty-nine states plus the District of Columbia have established renewable portfolio standards and five states have set targets at or above 50 percent, including Hawaii's 100 percent goal for 2045. If you are confirmed as Assistant Secretary of Energy for Electricity Delivery and Energy Reliability, how specifically do you plan on assisting the states with RPS provisions to be successful in their energy self-sufficiency and energy security objectives?

Answer: I believe that Federal and State policy makers should work together in close consultation on energy needs, especially those issues that have a deep impact on our nation's energy security. If confirmed, I will commit to working with the States on energy policies that impact the American public.

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Question 3: An annual survey conducted by the Department of Defense (DoD) found that a majority of utility outages were the result of electric disruptions. This survey estimates the financial impact of these outages is approximately \$500,000 per day. Improving energy resilience will not only sharpen DoD mission assurance, it will also save the DoD money. If confirmed, will you commit to encouraging technical collaboration between the DOE Office of Electricity and Energy Reliability and the DoD? This kind of collaboration is very important to Hawaii. As an island community, Hawaii's own ecosystem of resilience must also include the military.

Given your extensive professional expertise working with system operations in the electricity sector, how do you think the Department of Energy's Office of Electricity Delivery and Energy Reliability can best lend its technical expertise to improving energy resilience for the electric power system that service military installations throughout the country?

Answer: If confirmed, I look forward to identifying opportunities to address the security and resiliency of the electric grid for the safety and health of all the nation, including at our military installations. I will use my professional experience from being a field engineer in the beginning of my career to developing comprehensive recovery and reconstruction programs for New York City's Long Island City underground secondary network, and call upon the dedicated staff at the Department, to better secure (physical and cyber) the nation's electric power system.

Question 4: What more needs to be done from a technical standpoint to protect the systems that power military installations from cybersecurity threats? If confirmed, will you commit to ensuring DOE and the National Laboratories are in a position to provide technical expertise to DoD to help address potential cyber threats to our military installations?

Answer: It is my understanding the Department works closely with the Department of Defense on this important issue. If confirmed, I will work to learn and support the role the national labs play to help address cyber threats to our military installations and the electric grid.

Questions from Senator Tammy Duckworth

Question 1: A modern electricity grid that is flexible, resilient and accommodating of all forms of energy is critical to our Nation's security, economy and maintaining our way of life. I believe that the U.S. Department of Energy (DOE) and DOE National Laboratories play an important role in modernizing our grid.

In January 2017, the Obama Administration published a number of recommendations in the Quadrennial Energy Review (QER) on how DOE should accomplish the goal of grid modernization. Do you support these recommendations and, if confirmed, how will you implement these recommendations and prioritize grid modernization?

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Answer: I agree that a modern electricity grid that is flexible, resilient and accommodating of all forms of energy is critical to our Nation's security, economy and maintaining our way of life. While I am generally aware of the Quadrennial Energy Review, I am not familiar with all of the 2017 published recommendations. If I am confirmed, I will review recommendations from DOE experts, including the incredible people who work at the DOE National Laboratories, to formulate recommendations on how DOE can best accomplish the goal of grid modernization. This is a very high priority for Secretary Perry, so I look forward to drawing on my experience and the recommendations of others to implement steps that will modernize and protect our electricity grid.

Question 2: Earlier this year, the Secretary of Energy Rick Perry directed staff to author a report on electricity markets and reliability. The report suggests that grid operators and planners should focus on baseload generation as a way to mitigate reliability risks. However in PJM and MISO interconnections, both of which service Illinois, wind, solar, energy efficiency and fast-deploying natural gas are providing the same services as traditional baseload. Wind and solar in many regions of the country fit the report's own definition of baseload, namely that it must run at "high, sustained output levels".

It appears having an adequate resource mix is more important than having any single unit of generation. How do you reconcile the findings of Secretary Perry's report with data from grid planners and operators that indicate renewables have the capacity to deliver the same services as traditional baseload power plants?

Answer: I share Secretary Perry's view that an "all of the above" strategy is crucial to maximizing America's energy security. Different parts of the country deploy a varying portfolio of energy sources, depending on what is most abundant and reliable within their respective states and regions. While we should value the 24-7 reliability of traditional baseload generation, we should also invest in research that will enable us to maximize storage capabilities for renewables. This will enable us to attain even greater benefits from these emerging sources of energy.