Department of Energy
Washington, DC 20585

February 27, 2018

The Honorable Fred Upton
Chairman
Subcommittee on Energy
Committee on Energy and Commerce
U. S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On November 2, 2017, Principal Deputy Assistant Secretary Patricia Hoffman testified regarding a hearing entitled "The 2017 Hurricane Season: A Review of Emergency Response and Energy Infrastructure Recovery Efforts".

Enclosed are answers to questions submitted by Representatives Bilirakis and you.

If you need any additional information or further assistance, please contact me or Fahiye Yusuf, Office of Congressional and Intergovernmental Affairs at (202) 586-5450.

Sincerely,

[redacted]

Marty Dannenfelser
Deputy Assistant Secretary for House Affairs
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby Rush
Ranking Member

QUESTIONS FROM CHAIRMAN UPTON

Q1. Please provide a description and timeline of DOE personnel and activities on Puerto Rico and the U.S. Virgin Islands.

A1. The U.S. Department of Energy (DOE) continues to support restoration and recovery efforts related to Hurricanes Maria and Irma in Puerto Rico and the U.S. Virgin Islands (USVI). DOE Emergency Support Function #12 – Energy (ESF-12) responders were deployed to Puerto Rico in support of the Federal Emergency Management Agency (FEMA) until the week of February 19 and DOE continues to provide ESF #12 support to FEMA as needed. DOE ESF #12 responders deployed to the USVI demobilized on January 12 and a team from DOE's National Renewable Energy Laboratory (NREL) completed a deployment to perform assessments of USVI electricity infrastructure. A team of 25 available personnel and 10 line-trucks from DOE's Western Area Power Administration (WAPA) went to St. Thomas to provide mutual aid, through a DOE mission assignment from FEMA and at no cost to WAPA's rate payers, to restore the transmission system on the island. The WAPA crews completed work on the transmission system and finished work on November 29.

DOE has also relied upon subject matter experts from several Power Marketing Administrations (PMAs) to provide technical assistance to the U.S. Army Corps of Engineers (USACE) for restoration planning on Puerto Rico and had a person deployed to assist FEMA with ESF-15 – External Affairs. In addition to DOE's deployments of personnel, there are also DOE personnel who volunteered for the FEMA Surge Capacity Force.

Finally, Secretary Perry, Deputy Secretary Brouillette, and Under Secretary Menezes have all visited Puerto Rico and the USVI, and Assistant Secretary Bruce Walker spent two weeks in Puerto Rico to help coordinate electricity restoration efforts between FEMA, USACE, the Puerto Rico Electric Power Authority (PREPA), and industry. A timeline of key DOE activities is below:

- September 3: ESF-12 responders deploy to Puerto Rico, St. Thomas, and St. Croix

- September 4: ESF-12 responders deploy to the FEMA Region II Response Coordination Center; ESF-12 responders were already deployed to the FEMA National Response Coordination Center to provide 24/7 coverage for Hurricane Harvey
- September 6: Hurricane Irma impacts the USVI and Puerto Rico
- September 17: ESF-12 responders demobilize from Puerto Rico—PREPA reports 96% of customer outages from Hurricane Irma had been restored
- September 17/18: Advance team from WAPA travels to San Juan, Puerto Rico in preparation for arrival in St. Thomas
- September 19/20: Hurricane Maria impacts the USVI and Puerto Rico; ESF-12 responders on St. Thomas and St. Croix shelter-in-place with FEMA Incident Management Assistance Team
- September 19: ESF-12 responders pre-position in Atlanta, GA for deployment to Puerto Rico
- September 19/20: FEMA declares response to Hurricane Maria a Level 1 event and transitions incident support responsibilities of the FEMA Region II Response Coordination Center into the National Response Coordination Center
- September 20: Line-trucks from WAPA ship en route to St. Thomas
- September 22: ESF-12 responders arrive in Puerto Rico
- September 24: WAPA advance team arrives on St. Thomas, begins assessments of the transmission system, and prepares for arrival of additional personnel and equipment
- September 28–October 2: Seventeen additional personnel and the line-trucks arrive on St. Thomas, from WAPA
- October 4: USACE receives Mission Assignment from FEMA to support grid restoration in Puerto Rico. USACE formally requests subject matter experts from DOE to provide technical assistance; however, DOE and USACE had already been in close coordination in preparation for expanded mission
- October 6: DOE begins deployment of personnel to support FEMA with ESF-15 on Puerto Rico
- October 18: Subject matter experts from PMAs begin engagement in Puerto Rico to provide technical assistance to USACE

- October 23: Assistant Secretary Bruce Walker deploys to Puerto Rico for two weeks
- November 1: Assistant Secretary Walker visits St. Croix
- November 9: FEMA National Response Coordination Center demobilizes
- November 28: DOE Recovery Support Function responder deploys to Puerto Rico to support recovery mission under National Disaster Recovery Framework (NDRF)
- November 29: WAPA personnel and equipment complete restoration of the transmission system on St. Thomas
- December 12: NREL personnel arrive in the USVI to support assessments of energy infrastructure—onsite assessment complete within two weeks
- January 12: ESF #12 responders deployed to USVI complete demobilization
- January 26: DOE deployed a responder to Puerto Rico under a FEMA NDRF mission assignment to represent DOE as a primary agency in the Infrastructure Systems Recovery Support Function supporting the creation of the Federal recovery plan
- February 19: ESF #12 responders deployed to Puerto Rico demobilize—DOE subject matter experts remain deployed to provide technical assistance to USACE and DOE continues to provide ESF #12 support as needed

Throughout the deployment of personnel for Hurricanes Harvey, Irma, Maria, and Nate, the DOE Energy Response Organization has been activated at DOE Headquarters providing support to deployed personnel, FEMA, and other Federal partners as well as coordinating with industry. Personnel were also deployed to the Region IV and VI Coordination Centers and State Operations Centers in Texas, Florida, Georgia, Alabama, and Louisiana for hurricanes as well as California in support of wildfires.

DOE is also supporting implementation of the NDRF and serves as a primary agency for Infrastructure Systems on the Recovery Support Function Leadership Group (RSFLG). The RSFLG meets regularly to coordinate cross-cutting recovery issues specifically related to Puerto Rico and the USVI. DOE briefed the RSFLG on the One Vision Plan at its most recent Under Secretaries level meeting on January 9, 2018. The One Vision Action Plan for Power Restoration for Puerto Rico integrates plans and materials from multiple resources (New York Power Authority; PREPA; Puerto Rico Oversight,

Management, and Economic Stability Act (PROMESA); Governor's plan; and others) into a unified solution set. The draft Plan—due February 5, 2018, and to be released April 30, 2018—will incorporate resilient measures, and will be utilized in the Puerto Rico Recovery Plan. DOE also sent personnel to Puerto Rico through a FEMA Mission Assignment specifically to address recovery-related concerns there and work with other RSF partners to focus on a resilient recovery.

On Puerto Rico, as of February 21, PREPA reports that 84.5 percent of normal peak load and 85.6 percent of customers (1,261,513 of 1.47 million) have been restored and all 78 municipalities are at least partially energized or have an energized facility. As of February 21, approximately 92 percent of substations have been restored, and there were 4,896 line workers and associated personnel supporting the restoration efforts. USACE, as the coordinating agency for ESF 3 – Public Works and Engineering, received a mission assignment from FEMA to lead the Federal role in repairing the hurricane-damaged electrical power grid in support of the Government of Puerto Rico. USACE has partnered with PREPA, DOE, and FEMA to restore safe and reliable power to the people of Puerto Rico. USACE has awarded several major contracts to assist with the restoration efforts covering the crews and equipment to work on the transmission and distribution lines that need repairs, and for generators to stabilize the power grid, such as those installed in Palo Seco. USACE has also worked with PREPA to identify the materials and equipment needed for the restoration effort, which have been procured through the Defense Logistics Agency. USACE utilized the U.S. Navy's USNS Brittin Roll-On-Roll-Off Cargo Ship to transport these materials and equipment between Charleston, South Carolina and the Puerto Rico. In addition to the USACE restoration efforts, DOE and FEMA have worked closely with industry, through the Electricity Sub-Sector Coordinating Council, to facilitate mutual assistance and additional subject matter experts from utilities across the country.

In the USVI, as of January 31, the Virgin Islands Water and Power Authority (VIWAPA) reported that 51,473 customers (93 percent of total customers and 99 percent of customers currently eligible to receive power) have had electrical power restored. VIWAPA also began a *No Customer Left Behind* campaign aimed at reconnecting all

customers who can be restored to the electric grid and who may have been bypassed during the initial phase of restorations. As of January 31, following the completion of DOE's ESF #12 mission in the USVI and given VIWAPA's progress, DOE has discontinued regular updates on the restorations efforts but remains available to support if needed. DOE and FEMA have worked with industry to facilitate mutual assistance, including crews and equipment from the Northeast Public Power Association and VIWAPA has retained two off-island contractors to support the restoration efforts.

QUESTIONS FROM REPRESENTATIVE BILIRAKIS

Q1. You mentioned in your response to my question regarding challenges that still exist post-storm for Florida that Florida needs to re-examine its fuel distribution network since it was identified as a vulnerability following the storm.

Q1a. What resources (technical expertise and assistance, grants, etc.) are available from DOE to assist Florida as it re-examines its fuel distribution network and seeks to implement changes?

A1a. The U.S. Department of Energy (DOE), through the Office of Electricity Delivery and Energy Reliability, works closely with State and local governments on energy assurance planning, including fuel distribution. DOE also works with State and local organizations, including the National Association of State Energy Officials (NASEO), the National Emergency Management Association (NEMA), National Governors Association (NGA), and the National Conference of State Legislatures (NCSL).

DOE is supporting improved emergency fuel planning by providing technical expertise through organizations including NASEO and NEMA. The goal of these efforts is to enhance planning, coordination, and planning of fuel distribution during emergencies. These efforts will include the publication by NASEO of a fuel emergency guide for State governments and an emergency fuel planning workshop. The publication and workshop are meant to share best practices and provide planning templates, sample language for executive orders, and hosting exercises and planning workshops that will bring Federal, State, local, tribal, and territorial governments together with law enforcement and industry. These efforts are meant not only to unify effort, but also to unify messaging during an emergency to better inform citizens and customers of potential impacts and actions to take during an event. DOE anticipates completing these actions by May 31, 2018, in time for the 2018 hurricane season.

Q2. Florida Power and Light (or FPL) is the nation's 3rd largest electric utility and its smart grid is widely considered to be an industry 'gold standard' for performance and resiliency. In fact, FPL received 2 industry awards earlier this year for its performance during the 2016 hurricane season. Yet, despite the awards and continued system investments totaling nearly $3 billion since 2006, Irma laid waste to a large portion of the grid prompting FPL to announce that their West Coast system in Florida would need a "wholesale rebuild."

Q2a. What is currently being done to ensure better grid resiliency against future natural and manmade disasters?

A2a. DOE works closely with State and local governments and industry to enhance the resilience of the Nation's energy infrastructure. One way DOE ensures resilience is through existing emergency authorities. The Department has existing authorities under section 202(c) of the Federal Power Act to issue emergency orders during disasters or other energy emergency situations. DOE has leveraged these authorities in the past to support interconnection power flows to keep the lights on.

The Fixing America's Surface Transportation Act gave the Secretary of Energy new authority, upon declaration of a Grid Security Emergency by the President, to issue emergency orders to protect or restore the reliability of critical electric infrastructure or defense critical electric infrastructure. This authority allows DOE to support energy sector preparations for and responses to various events, including electromagnetic pulses (EMP), geomagnetic disturbances (GMD), and cyber and physical attacks.

As part of a comprehensive effort to reduce the impact of severe weather and other events, DOE has supported research and development to enhance resilience, including advanced grid technologies, microgrids, and energy storage. DOE continues to pursue increased resilience through other activities, including our recent Resilient Distribution Systems Lab Call awards. Under the Grid Modernization Initiative, DOE announced the award in September of up to $32 million over three years to the Grid Modernization Laboratory Consortium to support early stage research and development of next-generation tools and technologies to further improve the resilience of the Nation's critical energy infrastructure, including the electric grid and oil and natural gas infrastructure.

Another way DOE is working to ensure grid reliability in the organized markets is through the rule proposed to the Federal Energy Regulatory Commission in September that would ensure that certain reliability and resilience attributes of electric generation resources are fully valued. A reliable, resilient electric grid depends on a diverse mix of resources, and must include traditional baseload generation with on-site fuel storage that can withstand major fuel supply disruptions caused by natural and man-made disasters.

Q2b. What public utility and energy delivery challenges still exist?

A2b. The 2017 hurricane season highlighted the need for a focus on energy system resilience. The recent severe weather events, changing resource mix, and dynamic nature of grid technologies—including changes on the demand side—are bringing grid resilience to a new, more prominent place in the national dialogue on this topic. Specifically, as we keep an eye on day-to-day reliability, as well as resource adequacy, we must also incorporate additional issues related to resilience into the discussion.

Q2c. How do we proactively address during our recovery process?

A2c. DOE is cognizant of its unique role in addressing these challenges and that it is critical to be proactive and cultivate an ecosystem of resilience, including: a network of producers, distributors, regulators, vendors, and public partners, acting together to strengthen the ability to prepare for, respond to, and recover from disruptions. This includes continuing to partner with industry, other Federal agencies, State and local governments, and other stakeholders to address the issue of resiliency. Federal interagency partners are implementing the National Disaster Recovery Framework (NDRF) through regular series meetings of the Recovery Support Function Leadership Group (RSFLG). DOE is one of the primary agencies (along with FEMA and the Department of Transportation) under the Infrastructure Systems (IS) Recovery Support Function, which is coordinated by the U.S. Army Corps of Engineers (USACE). DOE briefed the RSFLG on the One Vision Plan at its most recent Under Secretaries-level meeting on January 9, 2018. The One Vision Action Plan for Power Restoration for Puerto Rico (PR) integrates plans and materials from multiple resources (New York Power Authority, PR Electric Power Authority, PR Oversight, Management, and Economic Stability Act (PROMESA), Governor’s plan, and

others) into a unified solution set. The draft Plan—due February 5, 2018, and to be released April 30, 2018—will incorporate resilient measures, and will be utilized in the PR Recovery Plan. During the recovery process there are opportunities to identify where additional or new mitigation measures could improve the overall resilience of the system, such as flood monitoring at substations, cement and composite poles to replace damaged wood poles, and incorporating advanced grid technologies.

Q3. Puerto Rico recently invited Tesla to pilot new technologies in the U.S. territory in an effort to get their grid back up in a low-cost, efficient manner. Are there other grid projects underway across the U.S. using this or a similar public-private model? If not, are there currently any barriers in statute that need to be addressed to pave the way for more such projects?

A3. Many companies have offered aid to Puerto Rico, looking to explore use of various types of technology and/or financing. Tesla specifically offered simple replacement of diesel engines, which gives Tesla a chance to test their product. Other companies are interested in financing commercial demonstrations of microgrids, which would generally be larger projects, but could involve major investments with uncertain returns. Issues in Puerto Rico have included theft of equipment and lack of certainty regarding return on investments.