

Attachment-Additional Questions for the Record
The Honorable Frank Pallone, Jr.

1. How can PREPA and individual power plants prevent another situation like the explosion at the Monacillo plant and the most recent island-wide blackout? In the event of one of these blackouts, what can be done to make sure they are as short lived as possible? Are there plans in place for these sorts of failures?

In my opinion, the actions that PREPA could take include maintenance, exercises, plans, and redundancy. More important, there is no substitute for investment in the energy grid. Since Superstorm Sandy in 2012, investor-owned electric companies on the mainland have invested more than \$230 billion in transmission and distribution systems. In Puerto Rico, it has been widely reported that few, if any, investments have been made in the island's energy grid for several years.

In addition, vegetation management had not been done for years in Puerto Rico. Reestablishing such a program now could be beneficial. Routine drills and exercises for all threats also allow electric companies to apply lessons learned and to enhance response and recovery capabilities.

Finally, stockpiling materials and having redundancy in place on the system reduce single points of failure. As I noted in my testimony, there were limited equipment reserves (e.g., poles, wire, transformers, insulators, etc.) in place in Puerto Rico prior to Maria and certainly not enough to support an emergency power restoration effort of this magnitude. Companies on the mainland, particularly those in hurricane-prone areas, stockpile as much material as possible so that mutual assistance crews have what they need to support the recovery.

2. Given that Puerto Rico's electric power infrastructure was known to be in poor condition before the 2017 hurricane season, should the grid be rebuilt using a different model than pre-storm condition? For example, do you think it makes sense to incorporate resiliency and hardening as Puerto Rico's grid is rebuilt?

My work in Puerto Rico has been focused exclusively on the short-term emergency power restoration, not on the future of the system. However, every electric company should focus on resilience. As noted above, there are many things that can be done to make energy systems stronger and smarter. Resilience comes from solid engineering (for example, incorporating redundancy into the transmission, sub-transmission, and distribution systems), a strong maintenance program, vegetation management, and better preparations and contingency plans. Technological advancements—such as smart meters—should be considered, but not at the expense of ignoring basics like spare equipment, routine maintenance, and vegetation management.

3. Please explain the risks to utilities caused by the absence of a strong regulator.

4. Please explain the risks to ratepayers caused by the absence of a strong regulator.

My expertise is in storm preparedness and restoration, not regulatory theory. However, I think a healthy relationship among regulators, energy companies, and customers drives balance and

accountability. Electric companies must make prudent investments for the benefit of customers, and be allowed to charge just and reasonable rates to recover those costs. Oversight from regulators is important for companies and customers alike.

5. What types of investments would be needed to incorporate technologies to make the grid stronger and more resilient?

As I stated in my response to question #2, my work in Puerto Rico has been focused exclusively on the short-term emergency power restoration, not on the future. That said, every electric company should focus on resilience, and there are many things that can be done to make energy systems stronger and smarter. Resilience comes from solid engineering (for example, incorporating redundancy into the transmission system), a strong maintenance program, vegetation management, and better preparations and contingency plans. Technological advancements—such as smart meters—should be considered, but not at the expense of ignoring basics like spare equipment, routine maintenance, and vegetation management.

6. Are there limitations in the federal support that can be provided? For example, does current law limit federal authority to incorporate a transition to renewable energy generation?

I am unaware of any federal limitations. I am not an expert in this area and am not qualified to answer this question definitively.

7. How does PREPA plan to accomplish upgrades and modernization if energy sales may drop even further as the island's population declines?

My work in Puerto Rico has been focused exclusively on the short-term emergency power restoration, not on the future of the system. This is a question that should be answered by PREPA.

8. What governance issues or reforms would help PREPA more quickly and successfully rebuild and modernize the grid? Should such alternative management regimes be considered?

This is not my area of expertise. This is a question that should be answered by policymakers in Puerto Rico.

9. What efforts are currently being taken to modernize Puerto Rico's electrical grid and to ensure that it will be resilient to future storms and less susceptible to blackouts? And how are electricity costs for consumers and businesses being considered as part of these efforts?

I recommend that PREPA and the Transformation Advisory Council (TAC) answer these questions. Again, my work in Puerto Rico has been focused exclusively on short-term emergency power restoration, not on the future of the system.

10. To what extent have efforts taken thus far to modernize Puerto Rico's electrical grid been informed by the Build Back Better report?

I am not sure how they have been informed by that report. This is a question that should be answered by PREPA.

11. In your testimony, you acknowledged that PREPA will be challenged once federal support is further reduced. What is being done to ensure PREPA is fully prepared to take over the restoration work currently being done by the Army Corps of Engineers and their contractors by May 18, when the Corps and contractors are scheduled to complete their "responsible drawdown"? Is there additional work that can be done to ensure would help ensure a successful transition?

As I noted in my written testimony, I have discussed this transition with PREPA's newly appointed CEO, Walter Higgins, and the rest of the Unified Command. We all agree that the responsibility for the long-term management of the island's energy grid ultimately must be borne by PREPA. My team on the island and I have worked on the transition from the Incident Management Teams to the PREPA leadership to complete the mission of restoring power to the remaining customers and to prepare the company for its next phase of recovery and mitigation.

12. Does Puerto Rico have an emergency response plan? If not, is such a plan being developed?

13. What is the Puerto Rican government doing to examine lessons learned from what went wrong in the response to Maria? How are these lessons being applied so that Puerto Rican officials and emergency responders can improve their performance if and when the next disaster strikes?

I would defer these questions to officials in Puerto Rico. We have impressed upon our colleagues in Puerto Rico the importance of having plans in place and drilling frequently. Walter Higgins, the new CEO of PREPA, testified before the Senate Energy Committee, indicating that PREPA is working on an internal and an island-wide drill before hurricane season begins.

14. How will the departure of the Army Corps affect recovery efforts on the island?

USACE's mission assignment to provide grid restoration work ended May 18, 2018, and USACE's power restoration contractor worked in parallel with PREPA and its contractors to support and transition PREPA as the host company takes over final restoration efforts.

FEMA issued [an extension](#) May 17, 2018, of the following USACE's mission assignments related to emergency power restoration:

- The lease, generation, and maintenance of all three mega generators until PREPA completes its purchase of these generators.
- Continued support for more than 700 generators that are in use throughout Puerto Rico.

- USACE’s logistics and materials management capability to complete the transfer to PREPA and PREPA’s assumption of the management of the emergency restoration materials

USACE also is overseeing the environmental remediation at 150 sites across the island in order to restore the sites disturbed during the emergency power restoration mission.

The Army Corps of Engineers was a key member of the Unified Command and provided helpful logistics support, but emergency power restoration is a specialty of industry and associated contractors.

15. Has Puerto Rico requested that FEMA extend the USACE mission assignment until power restoration efforts are complete?

According to a [FEMA press release](#), the direction provided by PREPA’s CEO, Walter Higgins, and the Energy Unified Command Group, as of May 18, is that USACE will no longer provide power line restoration work for PREPA. PREPA will oversee its contractors and the remaining work in grid restoration.

16. From what you have witnessed on the island, do you have any concerns about PREPA's role in grid modernization?

I believe PREPA has learned important lessons from this experience. As I said at the hearing, PREPA will be challenged to manage not just the ongoing restoration, but the future with the needed reconstruction and resilience work. The company will need to keep focus on safety, logistics, and materials, and it will need to balance the needs of the basic “blocking and tackling” of running the grid while considering the future of the system.

Based on my experiences on the island, I also strongly recommend that PREPA re-engineer and rebuild its energy grid to similar standards that are used on the mainland. As I noted earlier, resilience comes from solid engineering (for example, incorporating redundancy into the transmission, sub-transmission, and distribution systems), a strong maintenance program, vegetation management, and better preparations and contingency plans. Significant investments are needed to harden PREPA’s system, and the system needs to be maintained at all times, not just after an event.

In my opinion, PREPA also would strongly benefit from securing a contractor oversight service to help manage its contractor workforce and track the work being done.

17. What efforts are being taken to ensure that Puerto Rico is diversifying its electricity generation portfolio as it recovers?

I defer these questions to officials in Puerto Rico, particularly PREPA and the TAC.

18. How, if at all, are repairs to renewable power generation facilities being prioritized?

I defer to PREPA. I don't believe that PREPA owns any of the renewable power generation facilities on the island, so I do not know if it is involved in prioritization.

19. How many microgrids have been set up on the island? Where are they currently being used?

My understanding is that there were nine (9) microgrids set up on the island. They are currently being used in three sites: Arecibo (Choco Hondo substation); Culebra; and Vieques. The remaining six (6) microgrids have been decommissioned, but were located in Lares, Maunabo, Naguabo, Patillas, Villalba, and Yabucoa.

20. Are any of the recently installed microgrids currently being powered by renewable sources of power generation? Could some or all of these microgrids be transitioned to be powered from renewable sources?

There are no microgrids that were installed by the Army Corps of Engineers that operate with renewable sources of power generation. Microgrids are not my area of expertise, so I cannot answer whether renewable power generation facilities can be utilized at any of these sites.

21. What steps are being taken to transfer the operations and maintenance of these microgrids to more permanent arrangements?

There have been discussions at the Unified Command level (PREPA, FEMA, USACE and myself as the Power Restoration Coordinator) that PREPA will take over the operations and maintenance of the microgrids that will remain in Puerto Rico. As for the three microgrid sites they are as follows:

- a) Arecibo (Choco Hondo) – The Choco Hondo Substation was destroyed beyond repair from Hurricane Maria and will need to be replaced, so this will be a long-term installation for this microgrid. PREPA will need to provide the plan/schedule for the replacement of this substation. Nothing has been provided by PREPA to indicate whether it or a third party will be secured via an operations/maintenance contract for this site.
- b) Culebra – Will be in place until a plan/schedule is established and executed around the Vieques Temporary Power Solution (see item d).
- c) Vieques – Will require the Vieques Temporary Power Solution to be planned, scheduled, and executed, and this is being handled by PREPA at this time via a request-for-proposal (RFP) to obtain various power solution options to power both islands of Vieques and Culebra. The RFP includes the operation and maintenance and fuel for this installation. Note that Culebra will be fed by the Vieques Temporary Power Solution and fed from the existing 38kV undersea cable between these two islands that was tested and found to be in good conditions.

PREPA does not have the capacity to manage the operations and maintenance of the microgrids, and it has been urged by the rest of the Unified Command members to do so. To the best of my knowledge, PREPA has yet to put out an RFP for this required service.

22. How will the inclusion of microgrids help to improve the resiliency of Puerto Rico's grid in future storms?

Any questions regarding long-term plans for inclusion of microgrids in Puerto Rico's grid is for PREPA and/or the TAC to answer. That said, and as I stated in one of my responses during the hearing on April 11 when asked by Representative Griffith, I believe that microgrids are a part of the solution and could help the resiliency of Puerto Rico's grid in future storms. However, I also noted that the microgrid would need to be designed and installed to withstand the impacts of a storm (hardened/resilient or at least able to be temporarily removed and reinstalled after the storm). Furthermore, the infrastructure to get to the customers still would need to be built, and infrastructure that is fed by the microgrid would also need to be hardened/resilient.

23. Are battery storage facilities incorporated into any of the microgrids that have been set up by the Army Corps of Engineers?

To my knowledge, there is no battery storage built to any of the microgrids installed by the Army Corps of Engineers, but this question may be better answered by PREPA or the Army Corps of Engineers.