

October 31, 2017

The Honorable Lisa Murkowski, Chair
United State Senate Committee on Energy and Natural Resources
Washington, DC 20510-6150

The Honorable Maria Cantwell, Ranking Member
United State Senate Committee on Energy and Natural Resources
511 Hart Senate Office Building
Washington, DC 20510

Dear Senator Murkowski and Senator Cantwell:

Hurricanes Irma and Maria took a catastrophic toll on Puerto Rico's electricity system, affecting critical facilities and basic municipal, business, and residential functions. The hurricanes also caused significant damage to the electric grid's transmission and distribution assets. Two thirds of the island is still without power and has been without power for 50 days, while peak loads are currently reaching approximately 10% of pre-hurricane levels. Many key businesses and residents have begun fleeing the island. Without electricity, the island's water and sewage systems and cell towers remain inactive. If the grid stays offline, a large number of people will continue to be at risk of serious illness from heatstroke, dehydration, or exposure to contaminated water.

We are writing to you as former government officials who are extremely concerned about rapidly deteriorating conditions in the territory of Puerto Rico. We appreciate your October 26, 2017 letter to Senator Mitch McConnell and Senator Charles Schumer, but want to provide additional information as you review this issue and strongly urge you to take immediate action to direct all federal agencies to change course and rebuild the electricity grid based on energy efficiency, resiliency, decentralization and renewable energy. It is expected that Congress will act in the coming weeks on another budget supplemental hurricane bill. That legislation should direct federal agencies to change what they are currently doing in Puerto Rico, and also the US Virgin Islands, in rebuilding the electrical grid. We fear that federal dollars are being used to re construct the previous unreliable, expensive and dirty electricity grid that existed prior to the hurricanes. This makes little environmental sense and even less fiscal sense. Unless Congress intervenes and provides new direction to FEMA and other agencies, they will fund rebuilding the old electricity grid, and that grid will come down during the next hurricane as it did during Irma and Maria.

[Here is an op-ed](#) that we co-authored on this issue on October 27, 2017.

While 873 of 1,100 gas stations are open and the supply of diesel fuels to hospitals and other critical facilities has improved; the road to recovery will be long. The Governor has set a goal for 95% restoration by December 15th, however this is likely to be difficult as the U.S. Army Corps of Engineers estimates a full year for complete power restoration. Required repairs includes putting 62,000 distribution poles back up and the trucks needed to do so are in short supply. The head of the electric utility, PREPA (the largest public utility in the United States), estimates repairs will cost \$5 billion, with other estimates far higher.

Today, many workers from Puerto Rico and across the United States are working to rebuild the grid, funded in part by FEMA. However, under the constraints of the Stafford Act, these crews are rebuilding the grid 'as was'. And with many inexperienced workers, the quality of grid reconstruction may suffer. This process will return the island to an electricity system to using antiquated generation located far from the population centers, fragile transmission and distribution lines, and limited technological upgrades – which leaves Puerto Ricans paying more, getting less, and still exposed to hurricanes.

Even if Puerto Rico's electric grid is returned to pre-hurricane status – it would not be considered reliable, resilient, or cost-effective. PREPA targets have a monthly system average interruption frequency index of 0.33, or an expectation that on average, a customer will have four outages per year. However, historically PREPA customers experience 11.5 outages per year on average. Outage duration was also high. When outages occurred, the average outage was over two hours long. Puerto Ricans experience four to five times the number of service outages as U.S. customers on average, despite the fact that they pay the second highest rates (over 20¢/kWh) in the U.S. after Hawaii, driven higher by expensive imported bunker fuel.

The system's low reliability could in part be explained by the fact that PREPA hasn't performed major upgrades to its grid in decades, and the median age of the island's power plants at 44 years—more than double the industry standard of 18 years. It's hard to find replacement parts when individual pieces of equipment break down.

The pre-hurricane system also faced the problem of overcapacity. A recession starting in 2007 combined with an 11 percent decline in population to produce a 19 percent decrease in electricity consumption and a 14 percent decrease in peak load since 2004. With the rebuild of the grid taking months, one report suggests 500,000 people could leave the island for good as a result of the hurricanes, potentially leading to a future rate spiral – burdening those who remain with even higher costs for electricity.

Puerto Rico has an opportunity to rebuild quickly, and in a manner that supports the people's energy priorities: a resilient, cost-effective, de-centralized and sustainable grid. Even before the 2017 hurricanes, the island could have provided a significant fraction of its electricity with renewables at a net cost savings. Best-in-class power purchase agreement (PPA) offers for solar and wind — on the order of 10–15¢/kWh — will be lower than bunker fuel costs, even if damaged generators are replaced by higher-efficiency units. Renewable energy and energy efficiency would mitigate the macroeconomic impacts of fuel price volatility on the country's economy.

By coordinating rebuilding efforts with investment in renewables and demand-side management, there is an opportunity to realize even greater cost savings. Renewables and, especially, demand-side management and energy storage can provide peak generating capacity to the grid, allowing Puerto Rico to minimize investment in new generating assets. Locally deployed resources can also defer, minimize, or avoid transmission and distribution expenses. Designing the new grid for flexibility and avoiding capital costs reinvested in legacy infrastructure can allow for higher levels of renewable energy, likely at cost savings to the current system.

This coordinated investment would also be significantly more resilient and sustainable and decentralized. By siting generation closer to loads, especially in the North and in remote communities or islands of Vieques and Culebra, and connecting in “islandable” microgrids that can maintain operations during larger grid outages, it is possible to prioritize critical loads and minimize restoration time, as already seen with recent projects from Tesla and Sunrun, as well as other pre-existing solar systems on the island. Investments in microgrids and other distribution improvements, as well as energy storage can improve cost-effectiveness and reliability.

A coordinated rebuild would allow hard-hit communities and anchor businesses to be repowered earlier, and allow many communities the opportunity to shape and participate in the energy sector directly. Prioritizing distributed microgrids could avoid the costs of rebuilding certain costly and hard to access lines to remote communities while restoring services faster. An investment plan that leveraged this resource, and planned for eventual grid integration of most of these remote systems, would result in a

stronger and more resilient grid in the long run, minimize the risk of flight from residents and businesses currently without power, and require less total funding from the US Government.

To seize these benefits, a few key steps appear clear, and more will emerge from a coordinated response of all involved in Puerto Rico.

- Change key Stafford Act provisions to direct FEMA to fund a better rebuild of the grid, not rebuilding what was damaged by the hurricanes.
- Deploy federal funds (HUD, CDGB, Disaster Recovery, DOE, etc.), and other loans to quickly deploy solar and storage microgrids to key parts of Puerto Rico using an open and transparent procurement process. In other words, the opposite of what transpired with the Whitefish contract.
- Operational and business model restructuring of PREPA to ensure they are prepared to lead this rebuild and the operation of the grid thereafter
- Set a long-term vision, and support grid-level investment in new renewable technologies, storage, energy efficiency, distributed generation and grid intelligence to better prepare for the future and create jobs
- Support a strong and independent regulatory body to minimize costs, and ensure an electricity system that will support future energy policies that will help Puerto Rico rebound.

Your leadership in the weeks ahead, could help transform the entire electricity grid in Puerto Rico and the US Virgin Islands in a manner that will prevent future suffering by the residents of the territories and transform the economy. This is a situation where rapid investments in resilient, renewable and decentralized energy sources makes environmental, public health and fiscal sense. We would be happy to discuss these issues further and can be reached at Judithaenck@gmail.com and Ramon.Javier.cruz@gmail.com. Thank you.

Sincerely,

Judith Enck
Former EPA Region 2 Regional Administrator
(including NY, NJ, Puerto Rico and US Virgin Islands)

Ramon Cruz
Former Commissioner, Puerto Rico Energy Commission
Former Vice Chair, Puerto Rico Environmental Quality Board