

Rebuilding the Electric Grid After Recent Hurricanes

Compilation of CEBN Member Comments | Nov. 1, 2017

As federal agencies, local governments, and utilities work to help communities recover from recent hurricanes, there is an urgent need to restore power while also rebuilding the electric grid in a more reliable, efficient manner capable of withstanding future disasters. Expertise from the private sector can help inform these strategies to effectively meet the dual goals of rapid restoration of power and long-term viability of a more resilient grid. Below are a handful of ideas offered by members of the Clean Energy Business Network, which are particularly tailored to recovery efforts in the Caribbean. These suggestions are intended to begin a dialogue and are by no means comprehensive. As government leaders work to rebuild these areas, we encourage them to provide transparent channels for communication with affected stakeholders and the private sector to craft potential solutions.

1) First, there is a need to provide short-term solutions to restore power without locking in antiquated, inefficient energy systems.

- Many Caribbean islands rely on diesel. If more diesel gensets are deployed, they could be coupled with organic rankine cycle (ORC) technology to save 5-10% on diesel costs and reduce vulnerability to running out of fuel.
 - *Project example: ElectraTherm/Gulf Coast Green Energy developed an [ORC genset solution for Guantanamo Bay](#).*
- Where internal combustion engines are used, these could be designed to be as fuel-agnostic as possible—i.e., they could run on either diesel or natural gas, so as islands gradually move away from diesel, the engines could be easily converted to LPG or LNG.
- It may also be possible to deploy distributed generation—such as solar + storage, CHP internal combustion engines or microturbines, and other technologies at a wide variety of critical facilities in a relatively short timescale if there is a way to address interconnection issues.
 - *Project example: Capstone microturbines [kept facilities powered up](#) after Harvey, Irma, and Maria--now being deployed in FL.*

2) Over the longer term, there is a need to make energy infrastructure more reliable and efficient as it is rebuilt. This ranges from building-level to community-level to grid-level solutions.

- At the building level, rebuilding of structures must be done in compliance with new building codes to maximize weatherization/reduce demand. Care should be taken to avoid siting mechanical equipment in vulnerable locations.
- Distributed generation can be part of the solution for critical facilities, community-scale projects, and businesses that value resiliency. Technologies that can provide clean, reliable distributed power include: CHP, solar + batteries, biomass, fuel cells, and geothermal. The U.S. Army Corps of Engineers, Department of Defense, and other federal agencies have previously been involved in building small-scale, localized power plants in combat locations and could utilize these strategies in hurricane recovery.
- Community microgrids can keep hospitals, grocery stores, and areas of potential community shelter (e.g., schools) in operation after a storm.

○ *Project example: Greener by Design is engineering [community microgrids in Hoboken, NJ](#) and elsewhere in the state post Hurricane Sandy.*

- Solutions to make the grid more reliable include hardening distribution infrastructure and mandating maintenance. Techniques include installing telemetry to detect outages, using reclosers to expedite circuit restoration, and pruning trees to avoid line interference.

3) To move forward on resilient power rebuilding options in Puerto Rico specifically, businesses and the local government need greater certainty about the future structure of the power grid and its ownership.

- The U.S. government must work to provide a credible path forward to restore a functioning power grid operator. The Department of Energy's Electricity Policy Technical Assistance Program can provide independent and unbiased technical support on electricity-related policies to Puerto Rico.
- Businesses and the local government in Puerto Rico are exploring distributed generation (DG) options as communities rebuild, but their decision-making is heavily impacted by the current bankruptcy proceedings involving the Puerto Rico Electric Power Authority (PREPA) and the lack of certainty around the future structure of Puerto Rico's electric grid.
- The Army Corps has been providing rental diesel generators and has been able to get critical sites like hospitals and banks up and running--but these are not long-term solutions. The generators are not usually meant to run constantly and there are challenges with local access to and price of both propane and diesel fuel.
- Decisions to install more permanent distributed generation options are stalled. Existing regulations regarding on-site generation (e.g., interconnection and power purchase agreement policies) are confusing and subject to interpretation—these should be clarified as reforms are developed. Potential end users do not want to invest their time and money in a distributed generation system if the eventual grid will lock out such systems and be built around a more centralized power system approach. If a site installs a distributed generation system now, this would need to be done without permits because Clean Air Act/Title V and interconnection permitting are impossible without fully functioning governance mechanisms and certainty about PREPA's future. Therefore, the site may eventually be forced to dismantle the system in the future.

4) Businesses have solutions to offer but need a point of entry for discussions with federal agencies, local governments, and utilities. These entities should utilize a transparent, open contracting process.

- As unique needs arise in the recovery effort, relevant agencies and communities may not even be aware of all the existing technology and financing solutions to address these challenges. It would be helpful to have established points of contact and an open process for stakeholders to contribute solutions and see what works best for the affected communities.
- A competitive process will ensure communities receive the best solutions to fit their needs.