



Why Puerto Rico Should Consider Nuclear Power

October 17, 2017

Hurricane Maria left Puerto Rico in a state of destruction. The hurricane knocked out power to the entire island, and local officials estimated that 80 to 90 percent of structures on the island had been destroyed in the hurricane. Currently, Puerto Rico is still unable to provide power to almost a third of its residents, and it's estimated that they will not be able to receive power for four to six months.[1] In recent months, Texas, Florida, and other Gulf Coast territories and states have experienced high-category hurricanes, but no other state or territory has experienced as much destruction as Puerto Rico. Looking at the state of Puerto Rico's energy infrastructure, it appears that the destruction in the aftermath of Hurricane Maria may have been a consequence of an underlying issue: Puerto Rico's infrastructure was desperately in need of an upgrade to its resiliency.

Prior to Hurricane Maria's destruction, Puerto Rico's sole electricity provider, Puerto Rico Electric Power Authority (PREPA), already possessed a debt of approximately \$9 billion.[2] Furthermore, PREPA said that it would need over \$4 billion to overhaul all of its outdated power plants and reduce its dependency on imported oil. On July 2, 2017, PREPA filed for bankruptcy.[3] Now in the aftermath of Hurricane Maria, the cost to modernize and upgrade Puerto Rico's energy infrastructure has just massively increased. However, going forward, this may not be all bad news. In fact, this may be Puerto Rico's opportunity to rebuild its electricity infrastructure to become more resilient and more reliable in the face of rapid climate change and frequent natural disasters.

On the morning of October 6, 2017, when asked whether Tesla would be capable of rebuilding Puerto Rico's infrastructure, Elon Musk tweeted in response, "The Tesla team has done this for many smaller islands around the world, but there is no scalability limit, so it can be done for Puerto Rico too." Ricardo Rossello, the governor of Puerto Rico responded to the tweet saying, "Let's talk." [4] From this exchange, it's clear that the politicians of Puerto Rico support the rebuilding of the electricity grid and energy infrastructure using Tesla's solar panel and battery storage technologies. The question now remains: is this the best choice for Puerto Rico?

Nuclear power may be an option for Puerto Rico to consider with respect to rebuilding its energy infrastructure. In the past, PREPA has expressed concerns regarding Puerto Rico's heavy reliance on imported oil, and considering the frequency of natural disasters in the Gulf Coast region, nuclear plants or small modular reactors (SMRs) may provide an even more resilient power source in the event of extreme weather phenomena. When Hurricane Irma and

Hurricane Harvey brought devastation to the southern U.S., natural gas projects had to be shut down, solar power was heavily impacted, and wind turbines were automatically shut off as wind speeds approached the technology's limitation. Even weeks after the hurricanes had ended, energy analysts projected that it could take a month for all the gas projects that were shut down to operate at full output. During all these natural disasters, the one source of power generation that did not have to be shut down or rebuilt as a result of hurricane damage was nuclear energy. In Texas, the South Texas Project at Houston was even operating at 100% capacity during the entirety of Hurricane Harvey despite wind speeds peaking at 130 mph. Furthermore, the operators and staff at the South Texas Project plant said that flooding was not an issue because the reactor containment and housing were designed to be completely flood-resistant.[5] Moreover, if PREPA is citing heavy oil reliance as a rationale to spend \$4 billion on energy infrastructure upgrades prior to hurricane Maria, nuclear power can be a worthwhile investment for an island with little energy security.

Nuclear could also add a layer of resiliency to the island's energy system that would be desperately needed given the likelihood of catastrophic weather events in the future. While solar and battery storage technologies can provide a fairly reliable and environmentally-friendly energy source, they may nevertheless be vulnerable to extreme conditions created by tropical storms and hurricanes. A combination of renewables, energy storage, and nuclear power might provide the optimal balance of security, reliability, sustainability, and perhaps most importantly, resiliency, for Puerto Rico's power supply moving forward.

[1] Conditt, Jessica. "How Puerto Rico's power crisis ends." Engadget. Last modified September 30, 2017. <https://www.engadget.com/2017/09/30/puerto-rico-power-energy-crisis-hurricane-maria-prepa-tesla/>.

[2] Mufson, Steven. "Hurricane Maria has dealt a heavy blow to Puerto Rico's bankrupt utility and fragile electric grid." The Washington Post. Last modified September 20, 2017. https://www.washingtonpost.com/news/energy-environment/wp/2017/09/20/puerto-ricos-power-company-was-already-bankrupt-then-hurricane-maria-hit/?utm_term=.bd9e1c969d77.

[3] Grandoni, Dino. "The Energy 202: Why it will take so long to bring power back to Puerto Rico." The Washington Post. Last modified October 4, 2017. https://www.washingtonpost.com/news/powerpost/paloma/the-energy-202/2017/10/04/the-energy-202-why-it-will-take-so-long-to-bring-power-back-to-puerto-rico/59d40c6430fb0468cea81d50/?utm_term=.358ac02ad5ac.

[4] Cuthbertson, Anthony. "Elon Musk says he can fix Puerto Rico's energy crisis with solar panels and batteries." Newsweek. Last modified October 6, 2017. <http://www.newsweek.com/elon-musk-fix-puerto-rico-power-solar-tesla-batteries-679406>.

[5] Conca, James. "Hurricane Harvey makes the case for nuclear power." Forbes. Last modified September 1, 2017. <https://www.forbes.com/sites/jamesconca/2017/09/01/hurricane-harvey-makes-the-case-for-nuclear-power/#3bdb517c3625>.

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