

Rebuilding Puerto Rico's Grid

Dependable Electricity and Infrastructure is Key to
Economic Recovery

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JOINT ECONOMIC COMMITTEE
DEMOCRATS U.S. Senator Martin Heinrich
Ranking Member

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Hurricanes Irma and Maria shattered Puerto Rico a year ago, leaving behind widespread destruction and a humanitarian crisis. In addition to the devastating human toll, the storms devastated the already crumbling infrastructure on the island, particularly the aged electrical power grid.

Reliable electric power is foundational to a well-functioning society and to long-term economic growth. In most parts of the United States, it is easy to take for granted the security that comes from dependable electricity. In Puerto Rico, however, Americans are still struggling to access reliable electricity a year after Hurricane Maria wiped out power across the island—the longest blackout in U.S. history.¹

As Puerto Rico recovers from the hurricane's devastation, it faces key economic challenges. It is estimated that the island's gross domestic product will shrink by 11 percent by 2019.² Coming off an extended period of austerity and significant outmigration, rebuilding Puerto Rico's economy will require significant investments in its power grid and other important infrastructure. Supporting the local government's efforts to upgrade the grid will help ensure that Puerto Rico is prepared for the next crisis and is on the path to achieving strong and sustainable economic growth.³

Reliable Power is the Foundation for a Growing Economy

Infrastructure is critical to an economy's long-term growth. Businesses rely on well-maintained roads to receive supplies and move their goods to market. Clean and reliable water services support healthy residents and enable production activities. In addition, firms need reliable electricity to turn on the lights and power machines.

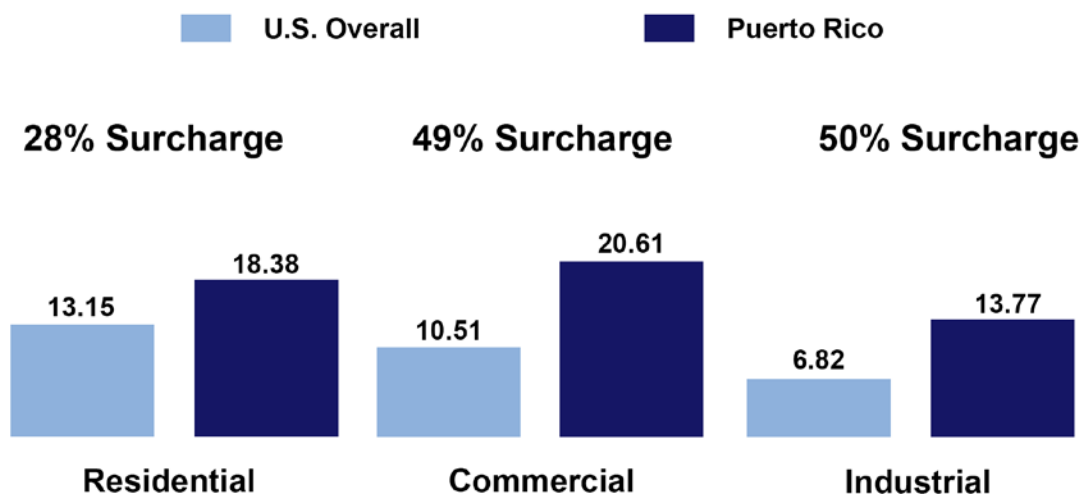
*The decline in business activity resulting from power outages is **compounding Puerto Rico's economic losses** and affecting consumers in other parts of the country.*

In the destruction left in Hurricane Maria's wake, Puerto Rico's businesses and exporters have struggled to resume operations in the face of persistent blackouts. Total exports from the island declined by nearly 21 percent in 2017.⁴ The decline in business activity resulting from power outages is compounding Puerto Rico's economic losses and affecting consumers in other parts of the country.

Production of drugs in Puerto Rico, which manufactures 13 of the world's top-selling brand name drugs, was slow to resume after the hurricane due to a lack of reliable electricity needed to refrigerate the drugs.⁵ Unreliable electrical power exacerbated shortages of life-saving drugs

across the United States.⁶ Going forward, businesses may be wary of establishing a permanent presence or continuing operations on the island if reliable electricity is not guaranteed.

Electricity Prices Higher on Island Than U.S. Overall



Source: Energy Information Administration.

Note: Average price in USD and cents per kWh during the week of August 16, 2018. Commercial sector encompasses all facilities and equipment used for producing, processing, or assembling goods, such as manufacturing and mining.



The lack of business and employment opportunities may also lead to further population declines and outmigration, undermining the island's economy. Without the promise of sustainable infrastructure and secure jobs, many families cannot afford to remain in or return to Puerto Rico.

In fact, up to 200,000 residents permanently left the island for the mainland after Hurricane Maria, adding to the hundreds of thousands who already had left due to the dire economic conditions prior to the hurricanes.⁷ With many working-age Americans leaving Puerto Rico to mainland states like Florida and Pennsylvania and with no plans to return, the significant decline in the labor force constrains the island's ability to get back on its feet.⁸ New Orleans experienced a similar population loss after Hurricane Katrina.⁹

In order to rehabilitate the business sector, create job opportunities, and attract new investment, Puerto Rico must deliver reliable electric power and other key infrastructure to businesses and residents.

Reducing Puerto Rico's Fossil Fuel Dependence Can Spur Growth

Puerto Rico, like other islands in the Caribbean, faces severe difficulties generating electricity. The majority of island nations in the region use imported fossil fuels to generate power, resulting in high electricity costs for residents and businesses.¹⁰ In fact, Puerto Rican consumers pay more for power than consumers in every state except Hawaii and Alaska.¹¹ On average, commercial electricity prices on the island are 49 percent higher than U.S. prices.¹² These high electricity costs contribute to a cost of living for Puerto Rican families that is 13 percent higher than the average cost of living when compared to 325 American urban areas.¹³

Reducing dependency on fossil fuels and transitioning to renewable energy sources can lower energy costs for families, as well as promote the island's energy resilience and enhance its economic competitiveness. Even a moderate shift achieved gradually over time will enable a marked improvement over Puerto Rico's current electric grid.

Other islands in the Caribbean are taking steps to reduce their dependence on fossil fuels and reaping the benefits. Jamaica, like Puerto Rico, is highly dependent on imported fossil fuels and uses imported petroleum for over 90 percent of the nation's electricity production.¹⁴ To lower costs and promote energy efficiency, the country has made a concerted effort to diversify its energy portfolio. New liquefied natural gas, wind, and solar projects will provide a significant amount of alternative energy to Jamaica's grid by March 2019.¹⁵ The shift in energy sources is projected to meet demand for more than half of the 700 megawatts that Jamaica requires, and will add to the 100 megawatts of wind and solar power already online.¹⁶

With limited capital available for energy system maintenance and repairs, investing in renewable energy sources may strain Puerto Rico's tight budgets. However, policy makers must weigh the costs associated with maintaining the current antiquated power grid against the long-term economic benefits of investing in new forms of clean power generation. These costs include the price of importing fuel for electricity generation, repairing fallen power lines each hurricane season, and frequent service interruptions.

Cities like Columbia, South Carolina have seen the benefits of transitioning to 100 percent renewables following catastrophic flooding. Now, renewable energy efforts are matched with sustainable water management and wastewater infrastructure improvements, which are designed to guard against future flooding.¹⁷ Making these investments today could mean the difference between future prosperity and prolonged recession in Puerto Rico.

Investing in Hurricane Preparedness Saves Lives and Costs

The Caribbean will face more hurricane activity as the effects of global climate change intensify.¹⁸ Merely rebuilding Puerto Rico's power grid to its state before the storm will not address the root of the island's infrastructural problems and will lead to higher costs down the road. To prepare Puerto Rico for future hurricane seasons, its power grid must be overhauled.

One step to reduce the risk of future outages would be to bury utility lines. Utility companies have resisted taking this action in the past, arguing that it makes more economic sense to restore fallen power lines than to prevent them from falling.¹⁹ The conversion of transmission lines to underground lines is costly, running an estimated \$1 million per mile in rural areas to \$12 million per mile in urban areas.²⁰ The long-run investment, though, would pay dividends in more reliable and less hurricane susceptible electric service, and greater public safety during the rebuilding stage.

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Hurricane Maria’s devastating human toll—current estimates put the number at nearly 3,000 deaths, with other studies estimating even higher casualties—underscores the necessity of basic infrastructure.²¹ Blackouts and other damaged infrastructure contributed to the death toll, affecting especially those residents who depended on refrigerated medications, respiratory equipment, and hospital care.²² Protecting essential features of the power grid will allow Americans to retain access to electricity during future natural disasters and help prevent human and economic losses.

Rebuilding for the Future

Puerto Rico’s recovery from Hurricane Maria and its economic future hinge on reliable access to sustainable, renewable, and affordable electric power. Going forward, repairing and upgrading the island’s power grid must be a priority for local and federal policy makers. Actions taken today can have concrete and positive effects on Puerto Rico’s economic trajectory and help the island meet its full potential.

Congress must continue to provide Puerto Rico with assistance to repair and upgrade its power grid. Investments that fortify this critical infrastructure and reduce the island’s dependence on fossil fuels can help limit the destructive impact of future hurricanes and set the stage for sustained economic development. By keeping Puerto Rico’s lights on, we can ensure that our disaster response efforts are supporting the millions of Americans who are working tirelessly to rebuild the island and create a more prosperous future.

¹ <https://www.vox.com/energy-and-environment/2017/10/30/16560212/puerto-rico-longest-blackout-in-us-history-hurricane-maria-grid-electricity>

² <https://www.pbs.org/newshour/economy/puerto-ricos-economy-will-shrink-11-percent-by-2019-governor-says>

³ <http://www.p3.pr.gov/assets/pr-draft-recovery-plan-for-comment-july-9-2018.pdf>

⁴ <https://www.bls.gov/mxp/puertorico.pdf>

⁵ <https://www.nytimes.com/2017/10/04/health/puerto-rico-hurricane-maria-pharmaceutical-manufacturers.html>

⁶ <https://www.nytimes.com/2017/10/04/health/puerto-rico-hurricane-maria-pharmaceutical-manufacturers.html>

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- ⁷ <https://www.eia.gov/state/print.php?sid=RQ>; https://www.washingtonpost.com/national/exodus-from-puerto-rico-grows-as-island-struggles-to-rebound-from-hurricane-maria/2018/03/06/b2fcb996-16c3-11e8-92c9-376b4fe57ff7_story.html?utm_term=.aaa301069480;
- ⁸ <https://centropr.hunter.cuny.edu/sites/default/files/PDF/Schoolenroll-v2-3-3-2018.pdf>
- ⁹ <https://www.citylab.com/equity/2015/08/10-years-later-theres-still-a-lot-we-dont-know-about-where-katrina-survivors-ended-up/401216/>
- ¹⁰ <https://www.imf.org/external/pubs/ft/wp/2016/wp1653.pdf>, p. 7-8
- ¹¹ <https://www.eia.gov/state/print.php?sid=RQ>
- ¹² Ibid. Note: Average prices are cents per kWh during the week of August 16, 2018.
- ¹³ <https://www.nytimes.com/2017/09/25/opinion/hurricane-puerto-rico-jones-act.html>
- ¹⁴ <https://www.mset.gov.jm/overview-jamaicas-electricity-sector>
- ¹⁵ <http://newenergyevents.com/the-diversification-of-energy-in-jamaica-is-bringing-stability-and-growth-to-the-island/>
- ¹⁶ Ibid.
- ¹⁷ https://www.sierraclub.org/sites/www.sierraclub.org/files/blog/1846%20RF100-CaseStudies2018_Report_06_web.pdf
- ¹⁸ <https://www.ucsusa.org/global-warming/science-and-impacts/impacts/hurricanes-and-climate-change.html#.W5wDKuhKiU>
- ¹⁹ <https://www.vox.com/energy-and-environment/2017/9/14/16301836/florida-irma-harvey-blackouts>
- ²⁰ <http://www.eei.org/issuesandpolicy/electricreliability/undergrounding/Documents/UndergroundReport.pdf>
- ²¹ <http://prstudy.publichealth.gwu.edu/sites/prstudy.publichealth.gwu.edu/files/reports/Acertainment%20of%20the%20Estimated%20Excess%20Mortality%20from%20Hurricane%20Maria%20in%20Puerto%20Rico.pdf>; and <https://www.nejm.org/doi/full/10.1056/NEJMsa1803972>
- ²² <https://www.nytimes.com/2017/11/08/us/puerto-rico-deaths-fema.html>