

Energy & Cleantech



Why Puerto Rico?

- \$10.5 billion in federal funding for overhauling and upgrading Puerto Rico's electrical grid.
- Biopharmaceutical manufacturing is the largest sector of the economy, as well as the most energy intensive. They achieve cost-effective reliability with onsite generation.
- The Invest Puerto Rico-led Energy Committee works with an array of technologies and perspectives to connect newcomers with viable energy experts.
- The island currently procures 3,750 MW of renewable power in pursuit of 100% renewable energy goals.
- Five SolSmart Certified communities support solar development in the municipalities of Barranquitas, Ciales, Morovis, Orocovis, and Villalba.
- 280 Solar Photovoltaic Installers on the island, representing a 2.89 Location Quotient (top 5 in the USA).
- Solar is Puerto Rico's fastest-growing source of clean energy; the metro area receives 2,900+ hours of sunlight a year.
- Wheeling rates allow industrial anchors to sell electricity to their neighbors.

Puerto Rico's energy sector is ripe for innovation and entrepreneurship. Utility scale projects, residential rooftop solar + storage, combined heat and power (CHP), and renewable sources like biogas, hydro, and wind power are areas of opportunity. These systems ensure business continuity and savings, community resiliency, and help attract investment. Companies and agencies around the island are committed to pushing Puerto Rico's energy transition forward, enabling economic growth.

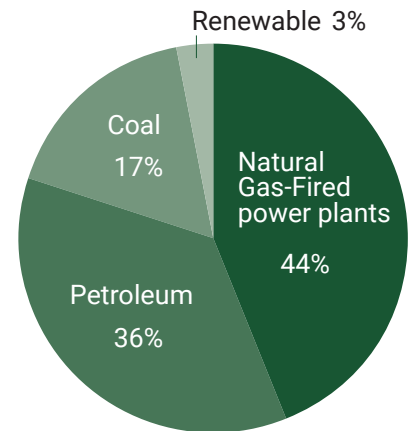
The island has shored up institutional support, including an independent public regulator (Puerto Rico Energy Bureau), supportive legislation, a private grid operator (LUMA Energy), and tens of billions of dollars in federal support for energy projects. In fact, only a handful of states have adopted a 100% Renewable Portfolio Standard with a 30% efficiency objective.

The Road to Energy Transformation

Puerto Rico's electric power sector suffered many setbacks from underinvestment and natural disasters, including the 2017 hurricanes that destroyed most of the island's electric infrastructure. 1.5M people were left without power.

The 2018 Puerto Rico Energy Public Policy Act sought to transform the island's power utility, mandating that the island obtain 40% of its electricity from renewable resources by 2025, 60% by 2040, and 100% by 2050. The law also phases out coal-fired generation by 2028. Also, as part of the reconstruction plan, the Puerto Rico Electric Power Authority (PREPA) chose LUMA Energy as the private entity to manage, operate, and maintain the electric transmission & distribution system and the generation assets.

For fiscal year 2021, natural gas-fired power plants generated 44% of Puerto Rico's electricity, petroleum 37%, coal 17%, and renewables 3%.



Source: U.S. Energy Information Administration

Undergoing an Energy Transformation

In 2020, PREPA filed their 10-Year Infrastructure Plan with a \$12.8B investment allocation to rebuild and transform the electric system, most of which qualifies for FEMA funding. This plan includes 256 projects focused on reliability & system resiliency, renewable integration, standards & regulation compliance, automatization, and hazard mitigation. By end of 2023, 195 projects will be near-term priority focusing on substation centers and dams/hydro improvements.

<p>Tax Incentives The Puerto Rico Incentives Code provides attractive tax credits for Energy & Cleantech</p>	<p>4% income tax rate on income generated from the eligible activity</p> <p>75% exemption from municipal taxes, excise & other taxes to contractors & subcontractors, not including manufacturing lead time</p>	<p>12% withholding tax rate on royalty payments, credible against the 4%</p> <p>50% exemption from municipal taxes</p>	<p>75% exemption on property taxes</p> <p>100% exemption from excise, sales, & use taxes on certain raw materials, and machinery & equipment</p>
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Renewable Energy Solutions

As Puerto Rico moves towards reaching its 2050 goal, the island welcomes all who bring innovative energy solutions, including solar, wind energy, hydropower, and CHP. For fiscal year 2021, about 3% of PREPA's electricity came from renewable energy, with solar photovoltaics (PV) accounting for slightly more than half, and wind power accounting for one-third of total renewable generation. The remainder came from hydroelectric and landfill gas-fueled facilities. Puerto Rico is home to both the largest wind power farm and one of the largest solar power generating facilities in the Caribbean.

Wind

Puerto Rico currently features two large-scale wind farms, Santa Isabel Wind Farm and Punta Lima Wind Farm. Together they generate over 120 MW. In October 2021, LUMA Energy, in collaboration with PREPA and the National Renewable Energy Laboratory (NREL), began the Wind Development Study to evaluate both onshore and offshore wind power to better understand the future of wind farms in Puerto Rico. This study is expected to be completed by September 2022. Furthermore, wind speeds on- and off-island reach a mean annual of 100 meters and, depending on location.

Combined Heat & Power (CHP)

CHP is one of the main ways Puerto Rico's biggest energy consumers (office buildings, hospitals, and manufacturing, among others) navigate the energy deficit. On-site cogeneration currently supports industrial and commercial operations in three core areas: energy savings, reliability, and emissions reductions. On-site CHP relies on established generator technologies that can operate continuously and, if needed, disconnect from the utility, and continue to supply power during a utility disruption.

Solar + Storage

As a tropical island, Puerto Rico can capitalize on the steady sunshine. San Juan has an average of 2,900+ hours of sunlight a year, with an average of 4.8 peak sun hours. The Solar Foundation, part of the Puerto Rican Solar Business Accelerator, showed that the island would need approx. 18k MW to generate the electricity consumed in 2019. Solar is Puerto Rico's fastest-growing source of renewable generation, increasing from 0.3% of total generation in fiscal year 2015 to 1.4% in fiscal year 2021. About 26 megawatts in new solar power and related storage battery capacity is scheduled to come online by end of 2022 and a peak of 12,000 new jobs to supply the demand of solar power.

Hydroelectric Power

Puerto Rico's 20 hydroelectric generating units are located on reservoirs that mostly supply drinking and irrigation water. These facilities are over 70 years old and need repairs; they currently provide less than 1% of the island's electricity. The new Integrated Resource Plan, along with PREPA and over \$1B FEMA funds allocated throughout 2030 for dams and hydro maintenance, are exploring options to update the facilities to increase their capacities.

The Road to Energy Transformation

- Coal Power Plant
- Hydroelectric Power Plant
- Natural Gas Power Plant
- Petroleum Power Plant
- Electric Transmission Line < 345 kV
- Petroleum Product Terminal
- Petroleum Port
- Solar Power Plant
- Wind Power Plant
- Biomass Power Plant

