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Electric Reliability and Resiliency in Puerto Rico

Power outages continue to heighten congressional interest in Puerto Rico's electric power infrastructure, which was damaged by hurricanes in 2017. On December 31, 2024, a reported switchyard breakdown occurred at the Costa Sur Power Plant on Puerto Rico's southern coast, where much of the island's electricity is generated. This event led to a power outage that affected nearly all electrical customers, and this issue and another issue at the Aguirre Power Plant caused a system-wide event that reportedly led to service interruptions that continued through January 3, 2025.

Issues of congressional interest may include the status of federal funding for energy projects and the performance of the electric system, among other considerations.

Federal Funding for the Electric System

Congress has provided funding for Puerto Rico's electric power infrastructure through a variety of channels in recent years, though comprehensive and authoritative data on the status of awards is difficult to collect. According to the Puerto Rico Electric Power Authority (PREPA), as of June 2023, the Federal Emergency Management Agency (FEMA), the Department of Housing and Urban Development (HUD), and other agencies awarded more than $15 billion in funding to restore and build a reliable and resilient energy system for Puerto Rico. Available data as of February 2025 reported by Puerto Rico's Central Office for Recovery, Reconstruction and Resiliency (COR3) indicates that federal funding since the 2017 hurricanes includes FEMA Public Assistance (approximately $13.5 billion obligated, including approximately $2.5 billion for emergency protective measures), FEMA Hazard Mitigation Assistance (approximately $1 billion authorized), HUD Community Development Block Grant (CDBG)-Disaster Recovery (DR): Electric Grid (approximately $1.9 billion), other HUD CDBG-DR funds (approximately $0.4 billion), and HUD CDBG-Mitigation funds (approximately $0.5 billion) for the Community Energy and Water Resilience Installations Program and other energy-related programs. Other funding includes the Puerto Rico Energy Resilience Fund ($1.0 billion) administered by the Department of Energy (DOE). DOE has issued a partial loan guarantee to Sunnova Energy Corporation; a loan guarantee to Clean Flexible Energy LLC, for Project Marahu; and a loan guarantee to subsidiaries of Convergent Energy and Power Inc., for projects that include renewable and battery storage development in Puerto Rico. Other authorized federal programs that could provide financial assistance for energy projects in Puerto Rico include the Environmental Protection Agency's Solar for All program and several U.S. Department of Agriculture Rural Development programs.

Some funding has been allocated to grantees. Of the more than $10 billion obligated by FEMA for permanent work under Public Assistance, approximately $2 billion has been disbursed as of February 2025. Of the $1.9 billion obligated by HUD's CDBG-DR for the electric grid, less than 1% had been disbursed as of July 2024.

Overview of Puerto Rico's Electric Power System

Puerto Rico's electric power system is isolated from other electric grids and is reliant on fossil fuel-fired power plants. PREPA is a public utility owned by the Commonwealth of Puerto Rico and is the largest supplier of electricity in Puerto Rico, with approximately 1.5 million customers. PREPA's generators have a combined installed capacity of nearly 5 gigawatts (GW). Together with independent power producers, Puerto Rico's electric power system has a generation capacity of approximately 6.3 GW; however, the available capacity is often less than the installed capacity. As of December 2024, distributed rooftop solar provides an additional 1.0 GW, for a total system nameplate capacity of 7.3 GW. Puerto Rico's total generation capacity, including distributed sources, is provided by a mix of sources fueled by petroleum (42%), natural gas (33%), coal (7%), and renewables (19%) (rounded to the nearest percent).

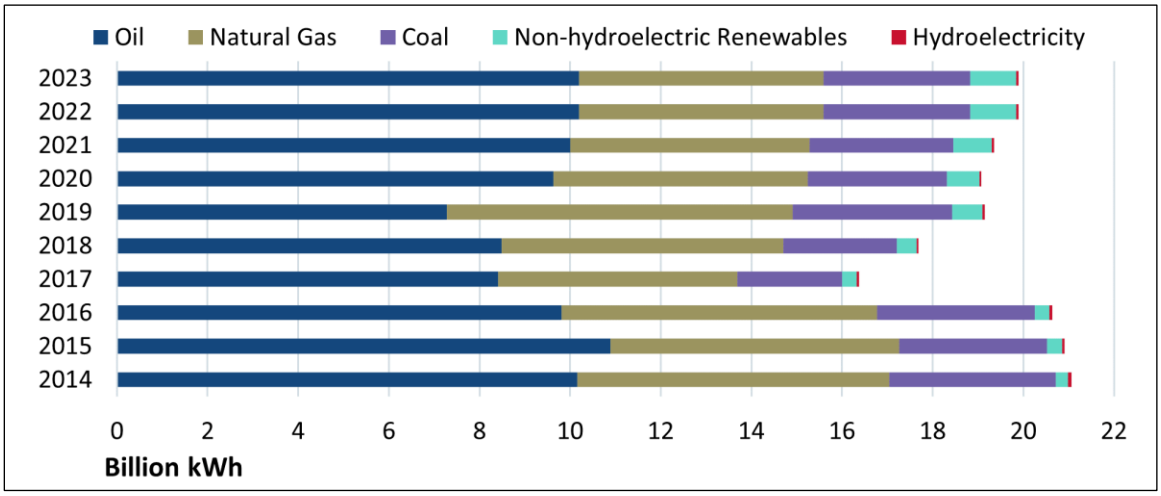
Before the hurricanes in September 2017, annual electricity generation totaled approximately 21 billion kilowatt-hours (kWh) (see **Figure 1**). After a decrease in electricity generation in 2017 as a result of long-term power outages from damage caused by the hurricanes, annual electricity generation increased from 17.5 billion kWh in 2018 to 19.9 billion kWh in 2023 (with a shift in generation source in 2020 due to earthquake damage). Over the same time period, the amount and share of electricity generation from utility-scale non-hydroelectric renewables also increased. In addition to the 2017 hurricanes, other disasters that have affected Puerto Rico's electric power system include earthquakes in 2020 and Hurricane Fiona in 2022.

Privatization and Energy Diversification Efforts

Since the 2017 hurricanes, the government of Puerto Rico has embarked on initiatives to improve the reliability (the ability of an energy facility or system to avoid power disruptions) and resiliency (the ability of an energy facility or system to recover quickly from damage) of the electric power system and its governance. These initiatives include taking steps toward privatizing aspects of the electric power system and diversifying the energy sources used for Puerto Rico's electric power generation.

Figure 1. Puerto Rico Electricity Generation, by Source

Figure is interactive in HTML report version.



Source: CRS, using data from U.S. Energy Information Administration, International Energy Statistics, generated January 21, 2025.

Notes: kWh = kilowatt-hours. Generation data consist of both utility and non-utility sources from electricity and combined heat and power plants, reported as net generation. Fossil fuels include coal, petroleum, and natural gas. Non-hydroelectric renewables include solar, wind, and landfill gas.

Since 2014, Puerto Rico laws that concern PREPA include Act 57-2014, which reformed PREPA's governance and oversight, and subsequent acts such as Act 120-2018 and Act 17-2019. Act 120-2018 aimed to end PREPA's monopoly over power generation, transmission, and distribution, and it provided for unsold assets to be operated by private companies. Act 17-2019 set renewable energy targets, including obtaining 100% of the island's power from renewable sources by 2050 (with interim goals for 2025 and 2040) and ending the use of coal for power generation by 2028. The law also prioritized enabling consumers to generate their own electricity and send excess energy to other grid users (known as net metering).

PREPA entered into agreements with private companies to manage some aspects of the electric power system. LUMA began operating and managing the transmission and distribution system on June 1, 2021. On June 1, 2023—two years after LUMA began operating and managing the system—LUMA stated that service interruption frequency had been reduced by approximately 35% and interruption duration by approximately 25% since 2021. Genera began operating and managing PREPA's non-hydropower generation assets on July 1, 2023. PREPA continues to operate its hydroelectric power plants.

In 2024, Puerto Rico enacted legislation amending electricity net metering program requirements and directed the Puerto Rico Energy Bureau (PREB) to begin a study to evaluate the impact of net metering and energy distribution no sooner than 2030. PREB is responsible for regulating, monitoring, and enforcing Puerto Rico's energy policy. Net metering can be controversial because utilities may shift the costs of grid services from program participants to non-net metering customers in an effort to recover costs associated with providing electricity.

Other Considerations

In early 2024, DOE and others completed an assessment determining that Puerto Rico could transition to 100% renewable energy by 2050, but the rate at which energy projects in Puerto Rico can be designed, constructed, and completed depends upon a number of factors. These include approvals from PREB and the Financial Oversight and Management Board (or FOMB), which was established under the Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA; P.L. 114-187) to lead efforts to restructure Puerto Rico's public debts (including PREPA). The FOMB has a responsibility in certifying fiscal plans for PREPA, among other activities. In 2024, FOMB filed a lawsuit challenging the amended net metering law. Efforts to negotiate a deal to address PREPA's debt continue. One key issue for some stakeholders is that Puerto Rico's electricity rates are some of the highest in the United States.

Other considerations may include how federal funding assistance has been implemented in Puerto Rico—some procedures rely on fixed-cost estimates limiting the number or types of projects that can be implemented as fiscal conditions change. Another consideration is whether actions by the Trump Administration—such as declaring a national energy emergency or Executive Order 14154, "Unleashing American Energy"—may introduce additional changes or flexibilities in approving and completing projects. In addition to executive actions, Congress could consider the effect of permitting on energy infrastructure projects—in Puerto Rico and elsewhere—and whether to alter permitting requirements or processes.

Corrie E. Clark, Specialist in Energy Policy

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