Congressional Research Service
Informing the legislative debate since 1914

INSIGHT

Comprehensive Energy Planning for Puerto Rico and U.S. Virgin Islands

Corrie E. Clark
Analyst in Energy Policy

November 6, 2017

Background

Hurricanes Irma and Maria caused extensive damage in the Caribbean and destroyed much of the electric power systems of Puerto Rico and the U.S. Virgin Islands (USVI). Congress has recognized that electric power systems in insular areas are vulnerable to hurricanes and typhoons and dependent on imported fuel (P.L. 109-58, title II, §251; P.L. 96-597, title VI, §604). Under 48 U.S.C. §1492, Congress authorized comprehensive energy planning, demonstration of cost-effective renewable energy technologies, and financial assistance for projects in insular areas related to energy efficiency, renewable energy, and building power transmission and distribution lines. Insular areas under 48 U.S.C. §1492 include Puerto Rico, the USVI, Guam, American Samoa, the Northern Mariana Islands, the Federated States of Micronesia, the Marshall Islands, and Palau.

Status of Comprehensive Energy Planning

Energy planning assesses current and future energy supply and demand, examines existing energy policies, and identifies potential challenges and opportunities in meeting future needs cost-effectively and sustainably. Two energy assessment reports were conducted under 48 U.S.C. §1492: a Department of Energy (DOE) report issued in 1982, which covered all insular areas, and a Department of the Interior (DOI) report issued in 2006, which covered all insular areas except Puerto Rico. Both reports acknowledge cooperation with territorial governments and utilities.

The DOE report states that no appropriations were received for the assessment; therefore, the scope was constrained to assessing the existing energy supply, existing demand data, and the potential for near-term commercially feasible technologies. The Energy Policy Act of 2005 (P.L. 109-58) directed the DOI to

Congressional Research Service
7-....
www.crs.gov
IN10811

update the 1982 assessment, which led to the 2006 report. Further, in 2010, DOI supported additional energy planning in the insular areas and excluded Puerto Rico. Additionally, the Consolidated and Further Continuing Appropriations Act, 2015 (P.L. 113-235) directed DOI to develop energy action plans. These plans for the insular areas—including Puerto Rico—would build upon comprehensive energy plans to provide a schedule, financial plans, and engineering plans for projects; however, no appropriations were specifically provided. The USVI was included in three of the energy planning efforts; Puerto Rico was included in one.

Puerto Rico Energy Planning

The 1982 Territorial Energy Assessment

The 1982 DOE report evaluated options to diversify Puerto Rico's energy portfolio to decrease reliance on imports. At the time, imported oil provided 98% of the system's electricity and hydropower provided 2%. Several resources were evaluated to displace oil for electricity generation: wind, hydropower, solar, bioenergy, ocean thermal energy conversion (OTEC), and cogeneration. The assessment projected savings in millions of barrels of oil imports, through the year 2000. Near-term priorities focused on wind and existing hydropower. The 1982 assessment stated that "the system experiences reliability problems because of its isolation, the large size of several units relative to total system size, limited quick response capability, and maintenance problems."

Recent Energy Assessments

According to the U.S. Energy Information Administration, Puerto Rico continues to rely on imported fossil fuels, which provided 98% of the electricity generated in 2016. Since the 1982 assessment, Puerto Rico diversified fossil imports, and in 2016, generation relied on natural gas (34%), coal (17%), and petroleum products (47%). Renewable energy remained at 2% of generation and included biomass, hydropower, solar, and wind resources.

Under Puerto Rico's Act 57 of 2014 (Act 57-2014), the Puerto Rico Electric Power Authority (PREPA) was directed to prepare an Integrated Resources Plan (IRP). The IRP identified potential strategies to meet electricity needs through 2035. These included new fossil fuel-fired generation, new renewable generation, retirements of several existing units, and transmission projects. The IRP assumptions reflected conditions as of June 30, 2015, including PREPA's financial situation. In February of 2017, the Puerto Rico Energy Commission disapproved the IRP, stating that

> The public needs assurance that the paths chosen in reliance upon an IRP are going to achieve public policy objectives of least cost, reliability, integration of renewables and lower environmental impacts. The IRP provided by PREPA was insufficient in terms of the process and mechanisms chosen for achieving the results contained therein. Therefore, the Commission is unable to rely upon the IRP filed by PREPA. If the IRP cannot be used for its intended purposes, then it is noncompliant.

Post-Hurricane Maria, the operability of the system has changed. On October 31, 2017, the Energy Commission granted an extension until December 31, 2017, citing a need to conclude an investigation into the current state of PREPA's electric system.

USVI Energy Planning

The 1982 Territorial Energy Assessment

The electric power system of the USVI is divided between St. Thomas and St. Croix. St. Thomas connects St. John to the system via cable. The 1982 DOE report stated that replacing imported petroleum products for electric power with indigenous energy resources could benefit the economy. Recommendations included reducing electricity and gasoline consumption. Alternative resources considered included solar for water heating, wind, and OTEC. Despite large reserve margins, the electric power system "experiences reliability problems because of its isolation and because of maintenance difficulties."

The 2006 Insular Areas Energy Assessment

In 2006, the DOI report assessed the energy system for insular areas including the USVI. Petroleum remains the primary source of energy. Recommendations included

- developing power purchase agreements with fuel oil suppliers, larger hotels, and resorts to increase efficiency and explore cogeneration opportunities;
- installing replacements for inefficient generation;
- evaluating feasibility of using petroleum coke; and
- assessing building energy efficiency standards and other metrics to reduce energy demand.

Issues for Congress

Much of the electricity infrastructure in Puerto Rico and the USVI is not operational. In addition to considerations of federal disaster assistance, Congress may consider comprehensive energy planning. Authority for DOE and DOI to provide financial assistance to insular area governments is available under 48 U.S.C. 1492. Assistance under DOI authority includes grants for power line projects designed to protect the system from damage caused by hurricanes and typhoons. Congress may consider providing appropriations to facilitate energy planning or improving system resiliency. Congress may also consider changes to existing authorizations to expand federal assistance for energy planning and rebuilding or modernizing the electric power systems of insular areas.