

**GOVERNMENT OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION**

IN RE: REGULATION ON MICROGRID
DEVELOPMENT

CASE NUM.: CEPR-MI-2018-0001

Subject: Notice of Proposed Rulemaking
and Public Comments

RESOLUTION

I. Introduction and Background

On October 27, 2017, the Puerto Rico Energy Commission (“Commission”) began an investigation with regards to the state of Puerto Rico’s electrical system as result of Hurricane María’s landfall on the Island (“October 27 Resolution”).¹ As a result of the damages to the electrical system and considering the critical role of the electric service in the economic development of the Island and the day to day lives of its citizens, the restoration of electric service must be one of the main objectives in the short term. Nevertheless, it is insufficient to merely identify strategies that allow for the restoration of electric service in the shortest possible amount of time, rather, it is also necessary that those strategies promote the development of a resilient, modern and agile electric system.

Aware of the need to restore electric service fast and effectively while simultaneously seeking its sustainable development in the long term, through Resolution and Order issued on November 10, 2017 (“November 10 Resolution”),² the Commission identified the installation of distributed generation, energy storage and microgrid systems as available alternatives consistent with these objectives. On such occasion, the Commission determined that the aforementioned technologies allowed:

- (i) the speeding-up of the electric service restoration throughout the Island, through the deployment of distributed generation projects financed, developed and operated by private or non-governmental entities;
- (ii) the strengthening of the electric system, reducing dependence on centralized sources of generation;
- (iii) the facilitation of electric service restoration on future occasions through the use of distributed generation systems and microgrids capable of operating independently from the rest of the electric grid; and
- (iv) the transferring of the responsibility of the restoration and

¹ Case Num. CEPR-IN-2017-0002, In Re: Energy Commission Investigation Regarding the State of the Puerto Rico Electric System after the Passing of Hurricane María.

² *Id.*

provision of electric service to multiple entities, allowing for greater access to economic, technical and human resources.³

These technologies are part of the energy public policy furthered by Act 82-2010⁴ and Act 57-2014⁵. The damages caused by hurricanes Irma and María, and the complexity associated with restoring electric service does not allow for the continued delay in developing and implementing a regulatory framework that encourages the deployment of distributed generation, energy storage and microgrid technologies.

Accordingly, through the November 10 Resolution, the Commission requested comments from the general public and, in particular from individuals and entities with a direct interest in the electricity sector, regarding the standards that the Commission should adopt to encourage the development of distributed generation, energy storage and microgrid systems. A microgrid is of a "group of interconnected loads and distributed energy resources [...] that acts as a single controllable entity with respect to [Puerto Rico Electric Power Authority's] grid."⁶ That is, a microgrid allows one or more customers to maintain and operate an independent electrical system, separate from PREPA's electrical system, so that the availability of electric service does not depend exclusively on PREPA's service and infrastructure.⁷

There are several examples of microgrids that provide their users greater control over the cost, quality, reliability of service and generation resources. Likewise, the development of microgrids has allowed certain communities to resist natural phenomena, providing continued service during massive blackouts due to said atmospheric phenomena. Worth mentioning is the microgrid developed and implemented by the New York University ("NYU").

NYU has a microgrid with a total capacity of 13.4 MW, which supplies electricity to a total of 22 buildings and installations. This system is interconnected to the city of New York's main electrical network. NYU's microgrid supplies the energy demand of the buildings and installations within the microgrid using its own energy resources, only purchasing energy from the main power grid when its demand exceeds the microgrid's capacity. This

³ November 10 Resolution at p. 2.

⁴ Public Policy Law on Energy Diversification through Alternative and Sustainable Renewable Energy in Puerto Rico, as amended.

⁵ Puerto Rico Energy Transformation and RELIEF Act, as amended.

⁶ Article 1.4 of Act 82-2010.

⁷ In the case of a single customer, these have more than one installation interconnected to the electrical system, so that, despite being a single customer for billing purposes, the customer's property has different points of interconnection to the electrical system and a native distribution system.

arrangement allows NYU greater control over its electricity consumption, the costs associated with its electric service and its generation resources and technologies.⁸

The microgrid's ability to disconnect from the main power grid allows NYU to continue receiving uninterrupted electrical service, regardless of the availability of the electric service provided by the incumbent energy service provider. As an example, after the Hurricane Sandy in 2012, NYU suffered no interruption in its electrical service and was able to continue operations without major setbacks, despite the fact that electric service in the majority of the city was interrupted for several days.⁹

II. Public Comments in response to the November 10 Resolution.

As indicated in Part I of this Resolution, by means of the November 10 Resolution, the Commission requested the general public to provide their comments and responses on various issues and questions identified by the Commission.¹⁰ The purpose of this request was to gather the public's opinion regarding the manner in which the Commission should use its regulatory authority over Puerto Rico's electricity market to establish the appropriate conditions for promoting the deployment of these technologies and encourages investment and economic development.

The Commission received a total of 53 comments submitted by individuals, non-profit organizations and private companies.¹¹ In general, the comments received focused on the following topics: (i) microgrid ownership structures, (ii) recovery of costs associated with development and operation, (iii) microgrid location priorities, and (iv) microgrid contract terms.

⁸ Microgrids at Berkley Lab, Lawrence Berkeley National Laboratory: New York University (<https://building-microgrid.lbl.gov/new-york-university>); New York University Cogeneration Plan, New York City, Thomas W. Overton, Power Magazine, Sept. 9, 2014 (<http://www.powermag.com/new-york-university-cogeneration-plant-new-york-city/>). NYU has opted mainly for the use of "combined heat and power" or "CHP" as a generation mechanism, which, in the particular case of NYU, has allowed to reduce total cost incurred in electric service and has generated annual savings of approximately \$ 5 millions to \$ 8 million.

⁹ How N.Y.U. Stayed (Partly) Warm and Lighted, Matthew L. Ward, Green: Energy, the Environment and the Botom Line, The New York Times, Nov. 5, 2012 (<https://green.blogs.nytimes.com/2012/11/05/how-n-y-u-stayed-partly-warm-and-lighted/?ref=energy-environment>); Microgrids Keep Power Flowing Through Sandy Outages, Martin LaMonica, MIT Technology Review, Nov. 7, 2012, (<https://www.technologyreview.com/s/507106/microgrids-keep-power-flowing-through-sandy-outages/>); Microgrids at Berkley, *Id.* Similarly, during the same weather event, the Princeton University micro-network in the state of New Jersey kept the university campus energized. Princeton University served as a base for police, firefighters, medical emergency corps and other rescuers, during critical days when the entire state was without electric service.

¹⁰ See Appendix A of the November 10 Resolution.

¹¹ Comments can be access through the Commission's website at: <http://energia.pr.gov/expedientes/?docket=cepr-in-2017-0002>.

A. Microgrid Ownership Structures

Regarding ownership structures, most commenters highlighted the existence of a variety of ownership structures, including: private, municipal, and cooperative microgrids. The Puerto Rico Manufacturers Association ("PRMA") advocated the development of microgrids whose owners were local communities and organized groups, in order to initially confirm the reliability of these systems before authorizing the entry of private financial markets. IBM, Quanta Services and Schneider Electric jointly recommended an initial pilot program owned through an energy cooperative. For its part, NRG Energy, Inc. ("NRG") commented that the ownership structure of a microgrid would depend on the end-user or group of end-users, and therefore different types of ownership structures would be applied depending on the particular needs of each customer.

B. Recovery of Costs Associated with Development and Operation

With regards to the recovery of the costs associated with the development of a microgrid, the New York State Smart Grid Consortium ("NYSSGC") emphasized the need for a rate and cost recovery structure that is sustainable in the long-term and encourages investment in the deployment of said technology. Enlace Latino de Acción Climática, The Williamsburg Bridge, Inc. and the Environmental Dialogue Committee, Inc., ("ELAC") commented that, in principle, the cost per kilowatt-hour ("kWh") of the energy produced by a microgrid should be capped at the cost per kWh billed by PREPA. Finally, NRG commented that service rates should be negotiated between the owner of the microgrid and the customer, and that the rate structure should include capital recovery, in such a way that the investors can adjust the risk of their investments.

C. Microgrid Location

The majority of commenters concurred that the location of a microgrid depends on (i) the vulnerability of the communities and the ability or lack thereof of PREPA to respond to service outages, or (ii) a variety of metrics including demographic data and load profile. In particular, the PRMA suggested prioritizing the development of microgrids in the northern portion of the Island in order to mitigate the dependence of generation plants located in the southern portion of the Island. NYSSGC suggested the following metrics as useful in determining the location of a microgrid: (i) load, (ii) demography, (iii) potential of resources, and (iv) scenarios of penetration of distributed energy resources, among others. Finally, ELAC emphasized that the development of the microgrid should give priority to the most remote communities that would be the last ones to be reconnected to the electrical system.

D. Microgrid Contract Terms

With regards to contract terms, most commenters favored the Commission being limited to developing general contractual terms. ELAC commented that any regulation should not force specific contractual terms. Nonetheless, ELAC did emphasize the need for contractual safeguards to ensure fair contracting between consumers and

owners/operators, as well as avoiding a negative impact on the environment in the development and operation of the system. NRG expressed its concern regarding the establishment of uniform contractual terms, which, it argued, could hinder investments in the development of microgrids. NYSSGC commented that uniform contractual requirements should be simple and abstract, since it would be impractical to establish specific contractual clauses through a regulation.

III. Proposed Rules

The proposed rules published today contain the components that the Commission considers necessary for there to be an accurate and reliable environment in terms of the rights, responsibilities and obligations of owners, operators and customers of a microgrid, therefore promoting the development and investment in such systems.

In general, the proposed rules establish microgrid categories based on their ownership structure, size, and whether or not it sales energy to third parties. This classification system seeks to ensure a rational and organized application of the regulatory requirements, in light of the nature and particular characteristics of each system, avoiding regulatory obstacles that would otherwise hinder the development of microgrids. In the case of small cooperatives, the objective of the Commission is to create a light regulatory framework, taking into account that a cooperative structure mitigates the need for broader regulatory norms. On the other hand, in the case of for-profit systems (where the owner of the microgrid sells energy to third parties), the Commission sought to establish the minimum safeguards necessary to protect the customer without creating obstacles to the development of, and investment in, said projects.

The proposed regulation provides for microgrids based on renewable resources (which generate at least seventy-five percent (75%) of their energy from renewable resources, and use fossil energy resources in a limited way, for example, to provide reliability and back-up service), as well as microgrids based on "combined heat and power" or "CHP" technology (where the use of thermal energy must represent at least fifty percent (50%) of the total energy produced). The proposed regulation also provides for hybrid systems, which combine renewable resources with CHP technology.

The proposed rules includes the tools and models that developers and microgrid owners can use to ensure compliance with the requirements applicable to each system category. The Commission will also develop simple registration forms to facilitate microgrid registration. The information compiles through these forms will allow the Commission to study the development of the microgrid market and anticipate future needs as these systems are interconnected to the PREPA's grid.

The proposed rule also establishes the consumer protections that apply to a greater or lesser degree based on the ownership structure and the size of the microgrid. These includes a cap on the cost per kWh that certain categories of microgrids can charge to their customers (this cap is initially set at the average of PREPA's rate of 20.22 cents per kWh, as of June 2017), billing requirements, resolution of complaints and non-payment, minimum



requirements related to contracts (in cases where the microgrid is dedicated to the sale of energy to third parties) and anti-discriminatory norms. The proposed rule also establishes the obligation of the microgrid to pay for the use of PREPA's infrastructure, when applicable.

IV. Comments and Public Participation

Pursuant to Act 38-2017¹², on this day, the Commission published in a newspaper of general circulation a notice on the proposed rulemaking. Pursuant to Section 2.2 of Act 38-2017, within thirty (30) days following the date of publication of said notice, the general public may present its comments regarding the proposed regulation. Comments can be submitted by email (comentarios@energia.pr.gov), by regular mail (Seaborne Building, 268 Ave. Muñoz Rivera, Plaza Level Suite 202, Hato Rey, PR 00918) or personally at the Clerk's Office, located at the address mentioned above. In addition, the Commission may hold a public hearing at which any person interested in participating in the process may appear. If said public hearing is held, the Commission will notify the date, time and place.

Be it published.

(signed)

Ángel R. Rivera de la Cruz
Associate Commissioner

(signed)

José H. Román Morales
Associate Commissioner
Interim President

CERTIFICATION

I hereby certify that the majority of the members of the Puerto Rico Energy Commission has so agreed on January 3, 2018 and on this date, I have proceeded with the filing of the Resolution issued by the Puerto Rico Energy Commission. For the record, I sign this in San Juan, Puerto Rico, today January 3, 2018.

(signed)

María del Mar Cintrón Alvarado
Clerk

Official Translation- Should any discrepancy between the Spanish and English version arise, the Spanish version shall prevail.

¹² Administrative Procedure Act of the Government of Puerto Rico.