

**BEFORE THE
ENERGY COMMISSION
OF PUERTO RICO**

**In Re: Regulation on Microgrid Development
(Proposed Rules)**

COMMENTS ON BEHALF OF THE AD HOC GROUP OF PREPA BONDHOLDERS

PA Consulting, Inc., as advisor to members of the Ad Hoc Group of Bondholders (collectively, the “Ad Hoc Group”) of the Puerto Rico Electric Power Authority (“PREPA”), submits these Comments to the Puerto Rican Energy Commission (“PREC” or “Commission”) in response to case number CEPR-MI-2018-0001, in Re: Regulation on Microgrid Development of the Puerto Rico Energy Commission (“Regulation” or “Rules”).

The Commission should be commended on its goal of providing a stable and predictable regulatory framework that supports the deployment of microgrids in Puerto Rico consistent with PREPA’s legal obligations. However, the Commission should not adopt any new rules that could be used to impair PREPA’s ability to own, operate, and maintain its infrastructure across the Commonwealth.

The Commission should be cautioned, however, that the current draft Rules pose significant financial and operational risks to PREPA and its customers. The proposed Rules have a number of points of ambiguity. They appear to authorize non-utility ownership and operation of private equipment on utility rights-of-way, permit the fragmentation of PREPA and its electric power system, could be read to allow the sale and lease of PREPA utility infrastructure to non-utilities at below full cost, fail to address the costs that microgrids will impose on the PREPA system, fail to address the recovery of Public Benefit and other Non-Bypassable Charges, and potentially enable unacceptable cost shifting to PREPA’s

remaining full-service customers. Moreover, as a general matter, the proposed Rules are insufficient for achieving the Commission's aims.

In addition to providing comments, the Commission should assemble a working forum of its choosing, for PREPA's major financial creditors, PREC and other interested stakeholders to develop the finalized Rules. Finally, the Commission should be mindful that, per the Trust Agreement under which PREPA's bonds have been issued, bondholder consent is required for the sale or lease of property currently owned by PREPA.

I. INTRODUCTION

The hurricanes of 2017 exposed significant weaknesses in Puerto Rico's management of its electric power system. The disruption to PREPA's utility network and extended restoration period have left too many people without electricity for too long. This unprecedented lack of access to reliable electricity has created adverse health, safety and financial consequences throughout Puerto Rico. Microgrids, along with other decentralized deployments of distributed energy resources ("DER"), are a proposed approach for storm hardening and for increasing electric reliability. Some utilities in the United States have been testing microgrids in order to identify cost effective uses, explore technical issues with integrating microgrids to larger grids, and identify operational limitations. The proposed Regulation allows for Microgrid business models that go well beyond deployments investigated by mainland utilities and regulators. While the dire situation in Puerto Rico may make it appropriate for the PREC to consider bold solutions, we believe that the proposed measures are likely to have significant unintended consequences that may ultimately decrease reliability, raise power prices, and compound the financial distress of PREPA.

II. BACKGROUND

A. Microgrid deployment in the industry comprises primarily stand-alone applications, not fully integrated with the broader electric distribution system.

Microgrids have become a frequent discussion topic in the energy industry. Some stakeholders foresee microgrids as a tool for modernizing the electric grid, enhancing system resiliency, and enabling customer choice. Microgrids comprised of renewable generating resources, such as Solar Photovoltaic (“PV”), may accelerate the utilization of DER. Discussions regarding microgrid deployments within the Commonwealth have taken on urgency in the aftermath of Hurricanes Irma and Maria, with the realization that microgrids may be able to provide the increased levels of system resiliency and operating flexibility to aid in future severe weather events.

From a high level, there are two different types of microgrids: “stand-alone” or “integrated.

In general, “stand-alone ” or “self-supply” microgrids of the type envisioned by the Commission’s Rules, are a mature technology that has proven to be effective and economic in campus-type (e.g. university, research institute, hospitals, large-multi-family, military, etc.) and remote-community applications, where the customer(s) have either a need and willingness to pay for higher levels of reliability or resiliency than can be expected of a centralized power grid , or where a community is geographically isolated from the centralized power grid because the development and integration of local DER for provision of power is significantly more economical than extending existing power lines. While the benefits of campus-type and remote-community microgrids are understood, industry discussions generally draw a distinction between these specific types of successful microgrid deployments and other applications still under study, in particular “integrated” microgrids. The Commission’s proposed, however, Rules currently make no such distinction, whereas one should be made.

Where feasible to construct, an “integrated” microgrid is one that is fully integrated with the operation and design of the local distribution power grid, comprising of distribution infrastructure owned and operated by the electric utility. An integrated microgrid provides customers within its boundaries (“Microgrid Customers”) with an integrated supply of electricity, balanced between power

produced locally within the microgrid and power imported from the broader electric grid. In addition, because they are an integral part of the surrounding electric power system, such microgrids can provide benefits to other distribution system customers outside of the microgrid area, such as such as capacity and reliability services.¹ This requires a great degree of coordination between the operator of the DER and the operator of the power grid, however, and integrated microgrids have only thus far been deployed under circumstances where a subset of customers are clustered together, electrically downstream of a common point on a distribution system that can be used as the single Point-of-Interconnection (“POI”) separating the microgrid from the rest of the power grid. This is most readily accomplished on a radial-type distribution circuit, where the Microgrid Customers are all at the end of the line behind a common POI, where a microgrid can be created without impacting other customers on the distribution circuit.

There are few deployments of integrated microgrids in the industry, however, and the cost and benefits of such systems are still generally being studied. A notable deployment of an integrated microgrid is in Borrego Springs, California. The Borrego Springs microgrid is composed of DER owned by the utility and private parties, and distribution infrastructure owned and operated by the utility (the San Diego Gas and Electric Company). This microgrid is similar to each other integrated microgrid deployments in the Unites States, in that the distribution infrastructure which interconnects loads and generation in the microgrid is solely owned and operated by the utility. Hence, integrated microgrids are de facto utility-deployed microgrids, utilizing utility-owned and operated electric distribution infrastructure.

B. Microgrid Rules must be consistent with PREPA’s obligations under the Trust Agreement.

¹ Case No. 9361 with the Maryland Public Service Commission, *Proposal for a Pilot Program to Create and Evaluate Public Purpose Microgrids*, the Potomac Electric Power Company, September 25, 2017 pp. 16-18.

The Trust Agreement under which PREPA's Bonds have been issued grants the PREPA bondholders a lien on PREPA's Revenues. The Trust Agreement also obligates PREPA to set rates sufficient to cover debt service,² and to not take any action to impair its ability to collect these revenues, amongst other obligations. In considering how best to establish rules to govern the introduction of microgrids in Puerto Rico, it is critically important that any prospective rules be evaluated in light of PREPA's obligations and commitments under the Trust Agreement. Failure to recognize PREPA's obligations under the Trust Agreement and structure the rules so as to enable PREPA's compliance with those obligations would almost certainly lead to litigation and create significant uncertainties that will negatively impact the potential for privately financed microgrid development in the near term.

C. The proposed Rules fail to address the costs that microgrids will impose on the PREPA system.

Microgrids, whether fully integrated with PREPA's grid or predominantly "self-supply" and exporting electricity only periodically, enable those Microgrid Customers to use PREPA's grid beyond the distribution infrastructure within the microgrid. Under everyday conditions, microgrid customers would effectively use the PREPA distribution grid as a virtual battery storage system that supplies them with supplemental electricity when the DER within the microgrid produce insufficient power to meet load (e.g. continuously during night time when PV systems provide no output, or an instantaneous basis throughout the day). In addition, the PREPA grid would be relied on as a backup power source for the fully "self-service" customers. Thus PREPA would be required to own, operate, and maintain an electric power system that is capable of providing each Microgrid Customer's full energy, capacity, or ancillary services requirements. These PREPA system capabilities, or put alternately, services provided to Microgrid Customers, comprise of costs that would need to be paid for by the Microgrid Customers.

² Act 57-2014 later made subject such rate adjustments to the approval of the Commission.

Many of these costs are fixed, and Microgrid Customers need to pay their share of those costs regardless of whether they rely on PREPA's grid for 100 or 100,000 kWh per year.

Further, an investment in microgrids is by its very nature an investment in power generation (and/or storage) capacity that is above and beyond what is normally required. Such investment in additional generating capacity in Puerto Rico, may result in significant stranded assets, the costs of which would be borne by other electricity rate payers. If there is significant development of microgrids and loss of load to PREPA then it is appropriate to consider whether there is stranded generation investment that microgrid users have a responsibility to pay for.

III. COMMENTS

A. Permitting of non-utility ownership and operation of private equipment on utility rights-of-way is inappropriate and poses risks to PREPA, its customers, and the public.

The proposed Regulation allows for non-utility lease and purchase of infrastructure currently owned by PREPA. It is inferred that the proposed Regulation would have the lessors or new-owners of electrical infrastructure operating their equipment on utility rights-of-way and easements. This proposal is unusual, it breaks industry precedent and the law, and we advise the Commission that such a practice poses risks to PREPA, its customers, and the public.

PREPA has been granted the privilege to own, operate, and maintain electric power facilities on utility rights-of-way and easements all across the Commonwealth. This right is codified through land ownership and right-of-access agreements between PREPA and others, and it is not clear how a transfer of ownership to non-utility parties would be accomplished.

More importantly, it is not clear how such a transfer of ownership of distribution assets would be in the public interest. PREPA has been granted its privileges on the basis that it provides a critical public good universally to all customers, and that it does so in a generally safe and reliable manner. Whereas the draft Regulation enables non-utility operation of private electrical infrastructure

on utility rights-of-way, it is not clear what standards, rules, and expectations will be applicable to the new owners or lessors of the private infrastructure. Under the proposed Rules, for example, a private party could operate its equipment in a manner that maximizes profit over safety or reliability, therefore resulting in poor outcomes for customers and the general public.

Typically, industry and regulatory discussions have included a distinction between microgrids that serve single properties such as a campus (e.g. university, medical, research, government, etc.), versus those integrated with the power grid. When discussing the latter type of microgrid, there is general recognition amongst stakeholders that the franchised utility would own and operate the distribution assets within it. The proposed rules in this case make no such distinction, and are unique, in our experience, in that they provide an unequivocal pathway for others to own and/operate the distribution assets currently owned by the utility.

B. The lack of a cap on microgrid size and customer composition enables fragmentation of PREPA and its electric power system.

The proposed Rules lack sufficient clarity as to the level of scale required for a “microgrid” to be considered the “macrogrid,” enabling the fragmentation of PREPA and its electric power system through municipalization, the formation of cooperatives, or third-party entities establishing for-profit local utilities and entering the market.

The proposed rules classify microgrids by size and customer composition, as set forth in Chapter II, Article 2, Section 2.01, C., which stipulates that “Large systems are those with more than 10 customers or generating capacity over 250kW.” This classification does not provide an upper limit to the size of a microgrid, and in failing to do so, the proposed Rules as a whole make it possible for non-utility entities to appropriate large portions of the PREPA electric power system under the guise of microgrid development.

While customer choice and aggregation are issues that Puerto Rico Legislature and the PREC may wish to consider, it is not appropriate to enable such activity through this proposed Regulation on microgrids. Attempting to do so can lead to unintended consequences and adverse financial and reliability outcomes for the electric customers of PREPA.

The lack of size limitations on microgrids and granting authority for a municipality or municipalities to establish microgrids using third parties has parallels to the creating of Community Choice Aggregation (“CCA”) in California. Third party marketers and generation developers have roiled the traditional utility structure in California where approximately 50% of the utility load is expected to migrate to CCAs over the next three years, creating complex questions related to long-term resource adequacy and stranded costs.³ While a comparable amount of load defection may ultimately be acceptable in Puerto Rico, California has some market structures to accommodate CCAs and is developing policies to deal with complex issues including stranded generation costs and requirements for long-term resource adequacy. In addition, the California ISO is evolved so there is an organized market for selling excess energy, purchasing energy shortfalls, and paying for the ancillary services necessary for to ensure grid stability with integrated microgrids.

C. Sale/lease pricing for PREPA-owned equipment must consider full costs.

As discussed above, the proposed Regulation in Section 5.05 (b) and Appendix A are ambiguous but may be read to allow provisions for non-utility purchase and/or lease of infrastructure currently owned by PREPA. Moreover, specific charges are proposed in Appendix A. The draft Rules do not offer insight as to how these proposed charges have been arrived at, and there could be a concern that these may not represent compensation of full costs to PREPA. For example, Appendix A provides a fee schedule for the purchase of PREPA property on a “per unit” basis, with the purchase cost of “Poles,

³ *Community Choice Aggregation Expansion in California and its Relation to Investor Owned Utility Procurement*, Bonson and Brashares, Center for Climate Protection, p. 4.

Towers, and Fixtures” proposed as \$1,133.70 per pole. This value represents a small fraction of the cost for PREPA to install a new pole. The Commission has an obligation to ensure that the proposed Rules appropriately consider the full costs to PREPA for its equipment.

Continuing with the aforementioned example, while the proposed per pole price may be appropriate in some cases, it is certainly not appropriate all cases. PREPA owns and maintains many thousands of poles across the Commonwealth, all of which vary in age, condition, duty (standard, high-strength, etc.) and size, and accounting value. Hence, because of this diversity in the pole asset class, there would be many cases under the proposed Rules in which higher-value PREPA assets would be sold at cut-rate prices. Each asset class of equipment owned by PREPA has similar levels of diversity that would need to be considered. A pricing schedule that considers these factors and offers pricing at a more granular level (e.g. offer prices for poles of various height or age) would be more accurate than a single price per asset class.

Moreover, it is not clear what pricing paradigm has been relied on in formulating the fee schedule in Appendix A. Whether an asset is most appropriately valued at book value, or replacement cost, or other another standard, requires careful consideration and may depend on the particular asset class in question. This is especially true in the utility industry, in which some assets are very long-lived, and may have long remaining useful lives even after fully depreciated in a financial sense.

Finally, it does not appear that the pricing in the proposed Regulation considers the debt incurred by PREPA in its construction and maintenance of the assets in question. Any lease fees must be sufficient to cover PREPA’s costs for maintaining and operating its infrastructure, as well as debt service. To the extent that PREPA is compelled to sell or lease system assets below cost, PREPA is being

prohibited from charging adequate rates from its services and is effectively subsidizing Microgrid Customers in violation of section 25 of PREPA's authorizing statute.⁴

Thus, the Commission has an obligation to ensure that fees generated through the proposed Rules appropriately consider the full costs to PREPA for its equipment. It is not clear that the Commission has yet met its obligation in the current draft of the Regulation.

D. The proposed Rules fail to address the recovery of Public Benefit Charges and other Non-Bypassable Charges.

In PREPA's last rate case the Commission identified a class of payments that are defined as subsidies.⁵ This class of payments includes the Contribution in Lieu of Taxes (CILT), low income discounts, and public lighting. The Commission ruled that these subsidies should be recovered from all customers with the exception of customers on certain low income rates and grandfathered net metering customers. The proposed Regulation is silent on whether customers on microgrids are responsible for contributing to those payments. Our position is that microgrid customers should not be able to avoid paying those public benefit charges, nor should they be able to avoid paying any other Non-Bypassable charges such as transmission charges. Should the Commission rule otherwise, it will constitute a cost shift to the remaining full-service customers of PREPA, as further discussed in the next section.

E. The proposed Rules risk shifting costs to full service customers.

The proposed Regulation carries with it the substantial risk of cost-shifting from Microgrid Customers to PREPA's remaining full-service customers.

As discussed in the prior sections, microgrids developed under the proposed Regulation can impose costs on the PREPA system that will need to be accounted for, along with any Non-Bypassable

⁴ 22 L.P.R.A. § 215.

⁵ Puerto Rico Electric Power Authority Rate Review, Final Resolution and Order, CEPR-AP-2015-0001, p. 134.

charges applicable to all customers. Should these costs not be appropriately tallied, this will result in unacceptable cost-shifting.

Moreover, cost of service dynamics have not been fully explored in the proposed Regulation and therefore the proposed Rules may result in cost assignment that is unfairly punitive for certain utility customers. No appropriate, embedded-cost-based recovery mechanisms have been established by the Commission in the proposed Rules to treat incremental costs and protect PREPA's customers from unfair cost allocations. Without a clear and convincing Cost of Service Study covering all embedded costs of PREPA's utility system and financing, the appropriateness and magnitude of cross subsidies between customer classes is not known.

The benefits of microgrids usually accrue over the long term, primarily through enhanced reliability, the incremental benefit of which can offset some new costs. Microgrids developed by stakeholders external to PREPA, however, absolve customers of payments into the system that fairly match their embedded costs. Further, any enhanced reliability would accrue no meaningful revenue benefit for PREPA. We therefore do not believe the proposed rules will result in the fair apportionment of costs to Microgrid Customers and will instead result in higher rates and unbalanced cost assignment that will punitively impact customers receiving traditional utility service.

Finally, the microgrids most likely to be constructed are those that are commercially attractive and those in locations where such projects can be safely financed. Therefore, we believe the proposed Regulation would result in inequitable cost-shifting from those customers who are better financially positioned to develop microgrid systems to those who cannot afford such systems.

F. The draft Regulation is insufficiently developed to achieve the Commission's goals.

The draft Rules touch on a number of important areas; however, as a whole the proposed Rules are incomplete and should be further refined in a number of key areas, including: 1) How microgrids fit into the long-term plan for the electric distribution system; 2) Coordination and siting; 3) Physical and

cyber security; 4) Reliability; 5) Microgrid operations in concert with the PREPA system; and 6) Parameters for battery storage.

1) Microgrids and Long-Term Electric System Plan

Microgrids need to be considered in the context of PREPA's long-term distribution plan, and as part of a broader deployment effort that considers all relevant stakeholders. While the proposed Rules potentially enable microgrid development, they risk doing so in a piecemeal fashion that risks customers in total, neither benefiting from a system that is more reliable, nor one that is more cost effective.

2) Coordination and Siting

Rules for siting and the coordination of activities in the development of microgrids are not addressed the Commission's document. While the proposed Rules appear to view microgrid deployment through only the lenses of electricity supply, and do not consider other key real-life factors, particular such as zoning, noise requirements, emissions requirements, and a host of other items.

3) Physical and Cyber Security

Neither physical nor cyber security requirements for microgrids are addressed in the proposed Regulation. Should this technology become used in significant scale across the Commonwealth, microgrids will become an increasingly important part of the electric power grid. Accordingly, it will be critically important to ensure that these resources are fully secure to both ensure that they are available when called upon, and that the resources cannot be used to compromise the operations of the broader electric power system within which they may be integrated.

4) Billing, Administration, and Metering

The proposed Rules are silent on how and by whom microgrid operations will be administered, how customer accounts will be billed and reconciled, and what metering requirements will be required to accomplish all of these.

5) Reliability

The proposed Regulation does not address the expected level of reliability to be achieved by a microgrid. While this technology has the potential to provide customers with enhanced levels of reliability and resiliency, if incorrectly deployed, microgrids can also result in the opposite effect. Without reliability standards, there is not guarantee that a microgrid will result in a better reliability outcome for all PREPA customers.

6) Parameters for Battery Storage

The proposed Rules do not discuss the operation of battery storage, how such devices are metered and operated, and what tariffs apply in their overall operation.

IV. CONCLUSION

As discussed above, the Commission should significantly amend the proposed Regulation on Microgrid Development of the Puerto Rico Energy Commission, and it should seek to do so in a collaborative manner with all interested stakeholders. Microgrids, at the potential scale and in the manner of use envisioned by the Commission, are an unproven and evolving technology. Identifying a framework that encourages an optimal deployment of this technology, for the benefit of the Commonwealth and its residents, will require significant input and innovation in the areas of technology, policy, regulation, and business models. Innovative solutions can only be achieved through the Commission's consultation with outside experts and through collaboration among the Commission, PREPA, its customers, major financial creditors, and other interested stakeholders.