

**COMMONWEALTH OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION**

**Regulation on Microgrid
Development (Proposed Rules)**

CASE NO.: CEPR-MI-2018-0001

COMMENTS OF PUERTO RICO SOLAR ENERGY INDUSTRIES ASSOCIATION

The Puerto Rico Solar Energy Industries Association (PR-SEIA) congratulates the Commission on its groundbreaking effort to advance resilient, renewable and reliable microgrids for greater energy security through decentralization and islanding of the Commonwealth’s energy supply. PR-SEIA offers these comments with the hope of clarifying and improving this regulation.

Article 1, Definitions: Renewable Energy

Section 1.08.B.1 and 31 define two types of renewable energy, “alternative” and “sustainable.” We believe that any technology worthy of the name renewable should be sustainable. We ask the Commission to consolidate these two definitions into one, to be known as “*Renewable Energy*” or “*Sustainable Renewable Energy*,” with the following modifications.

Section 1.08 B.1 Add electricity produced from heat engines such as Stirling, Brayton and Organic Rankine Cycle engines as an *Alternative* Renewable Energy source.

Delete **1.08.B.1.i-ii**. Waste-to-energy can release heavy metals and other toxins into the environment, and landfill gas has been shown to release fugitive methane, a powerful greenhouse gas, by disturbing the contents of the landfill in the process of gathering the methane fuel released by decomposition. Furthermore, these sources are only “sustainable” with the assumption of a continuing fuel stream. Waste reduction is an important part of sustainability; therefore we believe reliance on waste as a fuel should be discouraged.

Delete **1.08.B.31.iv–vi**. Combustion of biomass in the form of wood or crop residues, for instance, outstrips the fuel supply that can be sustainably harvested if used at any large scale, and deprives the soil of the nutrients supplied by decomposition.

It is not clear what “renewable biomass gas combustion” means. Anaerobic digestion, to which we have no objection, already appears at 108.B.1.iii, while landfill gas, to which we do object, is at 1.08.B.1.iii. There is no definition of “renewable biomass gas” or of “biofuel derived solely from renewable biomass.” We ask that these terms be removed, or at least defined in a way that ensures their exploitation will be within the limits of sustainable fuel supply and with safeguards against the release of pollutants, including greenhouse gas pollutants.

The draft rule allows for future recognition of new technologies as “*alternative renewable energy*,” **1.08.B.1.v**, or “*clean and/or renewable energy*,” **1.08.B.31.x**. We recommend adoption of criteria such as those we have raised above, *i.e.*, that any such new technology be exploited in a manner that does not exhaust the supply, does not release pollutants and does not harm the environment.

The draft regulation asks at **1.08.b.31.x** what consideration should be given to “clean” hydrocarbon fuels used in Combined Heat and Power. PR-SEIA appreciates CHP as an efficiency measure that multiplies the thermal or electrical output of fossil fuel inputs, but efficiency does not make it “clean and/or renewable energy.” CHP is separately defined and is recognized as a separate microgrid category. It should not be classified as renewable energy.

Other Definitions

We see an inconsistency between **1.08.B.10**, defining “distributed renewable energy” as a “distributed generator,” *i.e.*, as the generation equipment, while **1.08.B.8** defines “distributed generator” as the owner of the generation facility, including an individual. “Distributed Generator” could be renamed “Distributed Generator Owner,” and should be revised to include off-grid distributed generators.

Section 1.08.B.25 Add a reference to “energy storage” within the definition of microgrid, such as appending “and may utilize local energy storage to internally balance supply and demand for energy and allow it to operate fully independently of the grid.”

Redefinitions/Rule Extensibility

All mentions to PREPA (**1.08.B.12, 1.08.B.13, 1.08.B.22, 1.08.B.25, 2.01.B.6, 2.01.B.7, 2.01.E.6, 4.04, 4.05, 5.01, 5.02.I, 5.05, 5.07, 6.01.B, 6.03.I, 6.05.C, 6.10.A, 6.12, 6.15**) should be generalized or qualified to include future public and/or private utility(s) who will/may own the primary distribution infrastructure of the island. This could be accomplished through modifying the definition of PREPA in **1.08.B.30** to encompass any and all future owners of the current distribution infrastructure of PREPA.

Article 2, Microgrid Categories

Section 2.01.C defines small and large systems by both number of members and capacity in kW. This could lead to inconsistencies if one or more small-system members had loads that took the aggregate capacity above 250 kW or, on the other hand, if a residential cooperative microgrid had more than 10 members but less than 250 kW capacity. We suggest that any system with greater than 250kW capacity be classified as large and any system with less than 250kW be classified as small.

Section 2.01D PR-SEIA is concerned with the provisions which prevent microgrids from distributing their energy to any entities besides PREPA who do not have an ownership stake in the system (also see **Sections 4.01, 5.01, 6.01**). While we recognize the logistical and regulatory complexities associated with allowing this sort of energy sharing, we believe that it may prove essential to the long-term economic viability of microgrids on the island. We would recommend changing this to create an additional regulatory framework for cooperative, municipal, and 3rd-party-owned microgrids to engage in energy distribution to external entities who are not directly served by the microgrid. Absent engaging extensively in considering the possible legal frameworks to make this system possible here, we suggest that the Rule contain an explicit provision creating an additional type of microgrid which is not classified as “self-supply”, and allowing such type of microgrid to engage in the sale of energy to non-PREPA customers who do not have an ownership stake in the microgrid system. Because of the complexity of the subject, we encourage this provision to refer to the need for further policy changes before these provisions go into effect.

Section 2.01.E refers to “requirements” under the regulation and says that self-supply systems have “no requirements.” PR-SEIA believes this word was not well chosen; certainly

every system has at a minimum the safety requirements under the Codes and Standards of section 3.05. Since the purpose of this section is to assign the various microgrid classifications to Articles 4, 5 and 6, we suggest referring to the “provisions” of those articles or simply to the articles themselves as “applicable” to those classifications.

Article 3

Section 3.02 A.4 – PR-SEIA believes the definition of a renewable microgrids with 25% fossil fuels portfolio is too low. Although ideal microgrids should be designed for and use 75% or more of intermittent renewable energy, real-life conditions and complexities can result in actual generation from fossil fuels approaching 40% of the microgrid’s energy portfolio, and so the rules should allow flexibility for these real-life practicalities. PR-SEIA suggests modifying this to a maximum of 35% of the generation portfolio from nonrenewable sources, with as high as 50% in the microgrid’s first year of operation while the system is still being calibrated.

Articles 4, 5 and 6

Price Caps. The reference to the rate cap of 20.22 cents/kWh as the PREPA average rate for June 2017 in **6.05.B** is unrealistically low even for the energy alone. PREPA has not consistently been able to provide the “grid services” that are stated as included in that rate, nor the reliability and sustainability that microgrids will allow for as part of their operating costs. Hence, PR-SEIA believes the rates need to be modified accordingly to reflect the benefits and limitations of microgrid systems, which will require more extensive analysis. Because of the urgency of creating financial benchmarks for planned microgrid systems, we suggest setting a

rate cap of 24 cents/kWh for residential and 22 cents/kWh for the years 2018 and 2019. We then suggest these rates be later modified based on an extensive market evaluation, utilizing metrics which evaluate the cost benefit of the resilience of the microgrid system, as well as potentially other metrics such as avoided-cost analysis approved by the Energy Commission for services provided by the microgrid.

Procedure, oversight and review.

4.04, 6.12B: Small cooperative and municipal microgrids which are completely islanded will have no interaction with PREPA or any future island-wide utility, and should therefore have no requirement for financial payments to it at all. All microgrids should be designed with the ability to interconnect with, buy energy from, and sell energy to PREPA or any future island-wide utility, and they should have the option to either pay rates specified in Appendix A, or to pay \$25/mo per customer, should this prove to be the more economical option for the microgrid. We believe that this will allow greater pricing flexibility for small microgrid development.

Section 5.03 A.2 – This is a reasonable provision. However, it is not clear whether it applies on a month-by-month basis or annual basis. Measurement on an annual basis is more reasonable and consistent, since the monthly performance may vary widely, but still meet the intent on an annual basis. A monthly measurement may be unusually skewed or biased by climate or climate control (air conditioning). We suggest changing “consumes less than a monthly fuel oil limit” to “consumes less than the annual fuel oil limit”, and change Appendix B to calculate annual fuel rather than monthly fuel. Then add the following to the end of this clause: “Compliance will be

based on annual total fuel consumed.” We suggest a similar change to section **Section 5.03 A.3**, **Section 6.04 A.2**, and **Section 6.04 A.3**.

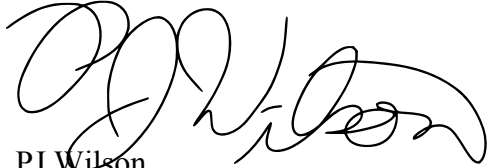
Appendix Comments

Appendix B page 1 – Template lines B, C, D, and E calculate the AC kWh production using a rough approximation. We recommend that there is a requirement that the PE submit a PV Sys model that shows the expected annual production. Any project of the complexity of a microgrid should be required to use this more accurate modeling capability.

Appendix B page 2 – The template specifies a DC-AC ratio of 1.15. This ratio should not be a strict requirement; rather, the proposed microgrid design should include the engineered DC-AC ratio. In real life circumstances, the AC output of a system can vary widely depending on panel orientation, inverter efficiency, battery efficiency, dust, and many other factors; requiring a strict ratio of 1.15 would unreasonably preclude many microgrid projects from moving forward.

Thank you for consideration of these comments on behalf of PR-SEIA. We look forward to an ongoing collaboration as these important rules are finalized, and appreciate The Energy Commission's attention to these important matters.

Signed,

A handwritten signature in black ink, appearing to read 'PJ Wilson', written in a cursive style.

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