GOVERNMENT OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION

IN RE: REGULATION ON MICROGRID DEVELOPMENT	**CASE NO.:** CEPR-MI-2018-0001 **Subject:** Adoption of Proposed Regulation on Microgrid Development

RESOLUTION

1. Through this Resolution, the Puerto Rico Energy Commission ("Commission") adopts and publishes the Regulation on Microgrid Development ("Final Microgrid Regulation"). As further explained below, the Final Microgrid Regulation sets the legal and regulatory framework required to promote and encourage the development of microgrid systems in Puerto Rico, enable customer choice and control over their electric service, increase system resiliency, foster energy efficiency and environmentally sustainable initiatives and spur economic growth by creating a new and emerging market for microgrid services.

I. Legal Basis

2. The Commission adopts and publishes this Resolution and the Final Microgrid Regulation pursuant to Act 57-2014, as amended, known as the Puerto Rico Energy Transformation and RELIEF Act; Act 82-2010, as amended, known as the Public Policy on Energy Diversification by Means of Sustainable and Alternative Renewable Energy in Puerto Rico Act; Act 83-2010, known as the Green Energy Incentives Act; and Act 38-2017, known as the Uniform Administrative Procedure Act of the Government of Puerto Rico ("LPAU", for its Spanish acronym).

II. Introduction and Brief Background

3. On October 27, 2017, the 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 Commission determined that the restoration of electric service was one of the main objectives in the short term. The Commission also determined, however, that it was insufficient to identify strategies that allow for the restoration of electric service in the shortest possible amount of time if those strategies were

[1] Case No. CEPR-IN-2017-0002, In Re: Energy Commission Investigation Regarding the State of the Puerto Rico Electric System after the Passing of Hurricane María.

not followed and supported by long-term policies designed to promote the development of a resilient, modern and agile electric system.

4. On November 10, 2017, the Commission issued a Resolution and Order ("November 10 Resolution") identifying the installation of distributed generation, energy storage and microgrid systems as viable alternatives for assisting in:

> (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 restauration and provision of electric service to multiple entities, allowing for greater access to economic, technical and human resources.[2]

5. On January 3, 2018, the Commission issued a Notice of Proposed Rulemaking through which it published its proposed Regulation on Microgrid Development ("Proposed Microgrid Rules"). Pursuant to LPAU, the Commission afforded the general public a 30-day period to file written public comments and suggested amendments and recommendations to the Proposed Microgrid Rules.

6. The Commission received a total of 38 written comments from persons and entities with a broad range of interests and experiences, from customers interested in gaining access to such services to entities engaged in the development of microgrid systems. The following entities filed comments: DT Energy Consultants ("D-TEC"), Organización Joven Piensa, Ricardo López Rivera, Javier Torres Espino, Dynamic Energy Networks ("DEN"), KOR Services LLC, ElectrIQ Power ("ElectrIQ"), John R. Henry, Schneider Electric, S&C Electric Co., Compañía de Fomento Industrial ("CFI"), Puerto Rico Association of Renewable Energy Consultants and Contractors ("ACONER"), Sunrun, Institute for Energy Economics and Financial Analysis ("IEEFA"), Enlace Latino de Acción Climática ("ELAC"), The Puerto Rico Electric Power Authority ("PREPA"), Tesla Inc., National Public Finance Guarantee Corp., Assured Guaranty Corp. and Assured Guaranty Municipal Corp. ("NPFGC"), McConnell Valdés, Ad Hoc Group of PREPA Bondholders ("Ad Hoc Bondholders"), Bloom Energy Corp., Sierra Club de Puerto Rico, Cámara de Comercio de Puerto Rico ("CCPR"), Chris Evanich, Francisco Laboy, Kevin W. Shockey, Energy Solutions Puerto Rico, Roberto D. Acosta, Oficina Independiente de Protección al Consumidor ("OIPC"), Instituto de Competitividad y Sostenibilidad Económica de Puerto Rico ("ICSE"), New York State Smart Grid Consortium, CAMBIO, Municipio de Bayamón ("Bayamón"), Energy & Environmental Consulting Services Corp. ("ESCOPR"), Natural Resources Defense Council ("NRDC"), US Green Building Council ("USGBC"), and the Conformity Assessment Steering Committee ("CASC").

[2] *Id*. at p. 2.

7. The Final Microgrid Regulation intends to promote the development of Microgrid systems by enabling their implementation through different business and operational models. The Final Microgrid Regulation recognizes three main types of microgrid systems: (i) Personal Microgrids; (ii) Cooperative Microgrids and (iii) Third-Party Microgrids.

8. Part III of this Resolution details the main revisions and amendments made to the Proposed Microgrid Rules and incorporated into the Final Microgrid Regulation. Part IV addresses additional issues raised by commenters or which are relevant to the Final Microgrid Regulation. Attachment A of this Resolution consists of the Final Microgrid Regulation. Attachment B of this Resolution contains a redlined version of the Final Microgrid Regulation providing a comparison of the Final Microgrid Regulation and the Proposed Microgrid Rules.

III. Main Revisions and Amendments Incorporated into the Final Microgrid Regulation

9. This part identifies and addresses the main revisions and amendments incorporated into the Final Microgrid Regulation. Aside from those described herein, the Commission made numerous additional changes designed to provide uniformity and clarity to the language and purposes of the Regulation. To review such changes, please refer to the redline version of the Final Microgrid Regulation included as Attachment B to this Resolution.

A. §1.08 – Definitions

10. The Commission made several revisions to the definitions included in the Proposed Microgrid Rules in order to simplify its content, increase their clarity and appropriateness, and exclude those deemed unnecessary or superfluous that, because of revisions made to other sections, where no longer necessary.

11. The terms "Cooperative Member", "Distributed Generation", "Microgrid Operator", "Renewable Resource", "Personal Microgrid" and "Third-Party Microgrid" where added to the definitions in Section 1.08 of the Final Microgrid Regulation. Of special importance are the terms "Personal Microgrid", "Cooperative Microgrid" and "Third-Party Microgrid" which encompass the three main types or classes of Microgrid systems.

12. Personal Microgrids consist of systems owned by no more than two (2) energy consumers and designed, primarily, to supply the energy needs of such consumers. This type of Microgrid is not subject to specific regulatory requirements under the Final Microgrid Regulation, except for those provided in Section 2.02 of the Final Microgrid Regulation.

13. The term "Cooperative" included in the Proposed Microgrid Rules was revised to "Cooperative Microgrid." Cooperative Microgrids permit three or more energy consumers to organize and jointly own and develop a microgrid system. The primary purpose of a

Cooperative Microgrid is to serve the energy needs of its Cooperative Members. Cooperative Microgrids could provide energy and other grid services to a person other than its Cooperative Members, subject to the provisions of Section 2.02 of the Final Microgrid Regulation.

14. Additionally, the definition "Cooperative Microgrid" was further amended to clarify that, for purposes of the Final Microgrid Regulation, said term refers to the joint-ownership of a Microgrid system by three or more Persons and that the term "Cooperative" does not refer to such term as it is used in Act 239-2004, as amended, known as the General Cooperative Associations Act. Accordingly, under the Final Microgrid Regulation, a Cooperative Microgrid may consist of an informal agreement between the corresponding parties or may be organized pursuant to either the Act 164-2009, as amended, known as the Puerto Rico General Corporations Act, Act 239-2004, or any other applicable law.

15. Third-Party Microgrids refer to systems developed for the purpose of selling energy services to customers, who have no ownership interest over the microgrid system, regardless of whether the owner of the system also receives energy services from the microgrid. In such cases, the microgrid provides services similarly to how a traditional utility would provide services to its customers and, therefore, Third-Party Microgrids are subject to additional requirements designed to define the rights and responsibilities of the microgrid owner/operator and its customers.

16. The terms "Ancillary Services", "Energy Producer", "Interconnection Charge", "Load", "Net Meter", "Power Purchase Agreement" and "Transmission Infrastructure" were removed from the Final Microgrid Regulation because they were either not used throughout the Regulation or were no longer necessary given changes made to other sections of the Regulation. Finally, the term "Green Energy" was replaced by the term "Renewable Resources" to better reflect the concept being defined.

17. Certain commenters, mainly the Municipality of Bayamón ("Bayamón") expressed concerns that the Proposed Microgrid Rules limited the ability of municipalities to engage in the development and operation of microgrid systems.[3] These concerns are further addressed in the discussion related to the amendments to Section 2.01 of the Proposed Microgrid Rules. However, the Commission amended the definition of the term "Person" so that it includes municipalities and other government entities (excluding PREPA). Accordingly, any municipality, or group of municipalities (including municipal consortiums) may own, develop or operate microgrid systems.

18. Finally, the Commission decided to remove the term "Community Solar" from the definitions included in Section 1.08 of the Final Microgrid Regulation. While a microgrid may operate in a manner consistent with what is referred to as Community Solar, Microgrid and Community Solar are not interchangeable concepts. Community Solar refers to a community sharing ownership of a solar generating facility or agreeing to purchase the energy generated by such solar facility. Community Solar may refer to small, distributed

[3] Comments of the Municipality of Bayamón at p. 12.

generation systems, operated and structured in a manner similar to a microgrid, or may refer to utility scale generating facilities. Act 133-2016 requires the Commission to define Community Solar. Because the Commission has yet to define the term Community Solar, doing so as part of this procedure would prevent the Commission from developing a definition and reaching the policy determinations that best promote the development of such initiatives. The Commission will, at a later date, initiate a procedure aimed at addressing the opportunities and benefits and societal values that may be derived from Community Solar initiatives.

19. The Commission also finds that removing the term Community Solar does not negatively impact or diminish the development of microgrids nor the overarching public policy contained in the Final Microgrid Regulation promoting the development of renewable and highly efficient distributed energy resources.

B. §2.01 – Microgrid Classification

20. The Proposed Microgrid Rule classified microgrid systems based on three characteristics: ownership structure, size and whether or not they engaged in the sale of energy services and/or other grid services. Section 2.01(B) of the Proposed Microgrid Rules identified numerous types of ownership structures, including sole proprietorships, partnerships, cooperatives, municipalities, corporations, non-profit organizations, among others.

21. Section 2.01(C) of the Proposed Microgrid Rules then divided microgrid systems into three categories based on size: (i) Individual, Small, and Large. Finally, Section 2.01(D) of the Proposed Microgrid Rules established that microgrid systems designed to produce energy primarily for the consumption by the owner(s) of the system would be classified as "self-supply microgrids" and prohibited such systems from selling energy services to any other person other than PREPA.

22. The Final Microgrid Regulation amended Section 2.01 to incorporate only three types (or classes) of microgrid systems: Personal, Cooperative, and Third-Party. Any of these types of microgrid systems may be owned or operated by any type of person, entity, municipality or government entity (other than PREPA) under whichever ownership structure and operating agreement they deem most appropriate. For purposes of the Final Microgrid Regulation, the key identifying factor is whether the main purpose of the system is to supply the needs of the system's owners or engage in the sale of energy services to customers who are not, in turn, owners of the system.

23. Based on these factors, microgrid systems are categorized into two main groups: Personal Microgrids and Cooperatives, which primary purpose is to supply the need of its owners, and Third-Party, which primary purpose is to provide energy service to customers.

24. With regards to size, under Section 2.01(C) of the Proposed Microgrid Rules, Small Microgrids were those with 3-10 customers and generating capacity of 250kW or less,

while Large Microgrids were those with more than 10 customers and generating capacity in excess of 250kW. The Commission found that the number of customer criterion would create an undue burden on Small Microgrids whose overall generating capacity increased nominally but are no longer considered Small Microgrids due to exceeding the number of customers by, for example, one.

25. Identifying the size of a microgrid is useful for determining whether a microgrid system will be required to comply with certain reporting requirements. Because those requirements mainly relate to matters associated with the generation of electricity, a differentiation between system sizes based on quantity of customers is unnecessary. Additionally, size differentiation is only applicable to Cooperative Microgrids, because Third-Party Microgrids are subject to the same regulatory requirements, regardless of their generating capacity.

26. Accordingly, the Final Microgrid Regulation removes from Section 2.01(B) the provisions related to system's size and incorporates such provisions as a new Section 4.02 within Article 4, which contains the provisions specific to Cooperative Microgrids. Small Cooperative Microgrids, therefore, are those with a generating capacity of 250 kW or less, while Large Cooperative Microgrid are those with a generating capacity exceeding 250 kW. Large Cooperative Microgrids are required to comply with the reporting requirements set forth in Section 4.05 of the Final Microgrid Regulation.

27. Section 2.01(E) of the Proposed Microgrid Rules identified the sections of the Proposed Microgrid Rules that would apply to each type of microgrid, based on the three types of classifications previously used: ownership structure, size and engagement in the sale of energy services. Section 2.01(B) of the Final Microgrid Regulation replaces prior Section 2.01(E) by using only the three microgrid categories—Personal, Cooperative and Third-Party—as the basis for identifying the relevant sections of the Regulation.

28. ACONER suggested that the size division between small and large be set at 500 kW.[4] CCPR suggested that 250 kW is too small to be a reasonable threshold.[5] Tesla suggested the threshold be 500 kW and 20 customers.[6] IEEFA expressed concern that the division between small and large systems was ambiguous and suggested the number of customers be the only differentiator between small and large systems.[7] As described before, the distinction between small and large Microgrids only apply to Cooperative Microgrids. Large Cooperative Microgrids are required to submit annual reports on fuel usage, generation and sales, as well as copies of any reports required by the US EPA and the Puerto Rico

[4] ACONER Comments, p. 2.

[5] CCPR Comments, p. 4.

[6] Tesla Comments, p. 2.

[7] IEEFA Comments, p. 2.

Environmental Quality Board. Based on the nature of these reports, the Commission decided to retain the threshold between small and large Microgrids at 250 kW.

29. Finally, the Final Microgrid Regulation does not preclude PREPA from developing microgrids. Nor do they limit the ability of a municipality to enter into a contract with a third-party provider to develop a microgrid as suggested by Bayamón.[8] A municipality can pursue the development of a microgrid itself or hire a third-party to do so. For example, among others, a municipality could (i) develop a microgrid system designed to supply the needs of a sports complex owned by the municipality (Personal Microgrid), (ii) along with two or more persons or entities, jointly own and develop a Microgrid designed to supply the needs of neighboring structures owned by the microgrid's owners, and (iii) develop, by itself or along with other parties or municipalities, a microgrid system designed to provide energy services to a particular group of constituents—regardless of whether the service is provided for a profit or not.

C. §2.02 – Sale of Energy Services and/or other Grid Services

30. The Final Microgrid Regulation incorporates a new Section 2.02 addressing the sale of energy services and/or other grid services by Personal Microgrids and Cooperative Microgrids systems. As a general rule, Personal Microgrids and Cooperative Microgrids are limited to providing energy and grid services only to its owners (or members, in the case of Cooperative Microgrids) and/or enter into other agreements with PREPA in order to provide such services.

31. Section 2.02(C), however, provides an exemption from the above-mentioned general rule for Personal Microgrids and Cooperative Microgrids to, after Commission authorization, provide excess energy or grid services to persons who are not owners (or cooperative members) of the system. Accordingly, Personal Microgrids and Cooperative Microgrids may request the Commission's authorization to provide (either free of charge or not) excess energy services and/or other grid services to neighboring customers, without being required to comply with the requirements applicable to a Third-Party Microgrid.

32. There is one basic principles delineating this exception: The sale of excess energy or the provision of other grid services to these neighboring customers must be incidental to the operation of the microgrid. The primary purpose in designing and developing the system cannot be to engage in the sale of energy services and/or other grid services to customers other than the owners or members of the system.

33. The purpose of including the exception described in Section 2.02(C) is to recognize the economical and societal benefits derived from allowing Personal and Cooperative Microgrids to provide, from time to time, energy services or other grid services to neighboring customers who are not themselves owners or members of the microgrid. The owners or members of the system may derive revenues from the sale of these services which would help alleviate financing, maintenance and operational costs. Neighboring customers,

[8] Bayamón Comments, p 12.

on the other hand, may gain easy access to enhanced energy or grid services, such as reduced energy costs, back-up power, and enhanced reliability, among others, without requiring changes to the organizational structure of the microgrid system.

D. §3.02 – Eligible Generation Resources

34. The Final Microgrid Regulation compiles within a single section, the requirements and provisions regarding types of generation resources that may be used by a microgrid previously scattered throughout Sections 3.02, 3.03 and 3.04 of the Proposed Microgrid Rules.

35. Section 3.02 of the Final Microgrid Regulation maintains the 75-25 percent ratio between renewable and fossil fuel generation but amends the standard to refer to energy output rather than energy input. Accordingly, under the Final Microgrid Regulation, a renewable energy microgrid refers to a system of which 75% of its total energy output during a 12-month period is derived from a Renewable Resource. The remaining 25% of energy output may be derived from fossil-fuel generators. The Commission determined that focusing on energy output, rather than input, allows for sufficient and achievable reliable operation at reasonable costs.

36. Act 133-2016 introduced the concept of microgrid systems within the general framework established by Act 82-2010. Act 82-2010 sets forth the public policy goals related to the development of renewable energy resources, the reduction of traditional fossil fuel generation and the adoption of energy efficiency measures as means to reduce energy costs, diversify energy resources and reduce the impact of energy generation on the environment. Accordingly, microgrid systems in Puerto Rico must be, overall, consistent with such policy goals. The Commission found that requiring renewable microgrid systems to meet a minimum threshold of 75% of its energy output to be derived from renewable resources (plus storage), ensures compliance with Act 82-2010.

37. Additionally, the Commission added efficiency requirements for the fossil fuel generation portion of the microgrid by requiring the fuel used by the non-renewable portion of the generation to not exceed 2,500 Btu per total energy produced by the microgrid and limit the heat rate at full output of the non-renewable portion of the system to not exceed 13,000 Btu/kWh.[9] These requirements ensure that renewable microgrids continue to comply with the public policy goals of Act 82-2010.

38. For combined head and power ("CHP") microgrid systems, the Commission maintained the requirements that the useful thermal energy output of the system be no less

[9] As an example, this standard may be met by a generator operating at 10,000 Btu/kWh, providing 25% of the Microgrid electric energy.

than 50% the total energy output and that fuel input minus useful energy output is no greater than 7,000 Btu per kWh of generator output.[10]

39. The Final Microgrid Regulation retains the concept of hybrid microgrid systems. By hybrid microgrid systems the Commission refers to a microgrid that uses energy from both a CHP system and a renewable system, with up to 25% of the energy output of the renewable system being generated by fossil fuels. As an example, assume a hybrid microgrid system were 60% of its total energy output is supplied by the CHP portion of its generation and the remaining 40% is supplied by the renewable portion of its generation. If the renewable portion (40% of total generation) is comprised of a mix of solar and fossil fuel generators, only 25% of its output (i.e. 10% of total generation) can be generated from fossil fuels.

40. Because the renewable portion of the microgrid must comply with the requirements applicable to renewable microgrid systems, 75% of the total energy output generated by the renewable portion of the microgrid would be derived from the solar generators and the remaining 25% would be derived from fossil fuel generators. Accordingly, the total energy output by generation resource would be as follows: 60% of total generation would be derived from CHP, 30% from a renewable source and 10% from fossil fuel generators.

E. §3.03 – Forms of Demonstrating Compliance

41. The Final Microgrid Regulation adopts a new Section 3.03 which contains the mechanisms for demonstrating that a microgrid system complies with the requirements for each type of generation resource: renewable, CHP or hybrid, as applicable.

42. Consistent with the revisions to the 75-25 percent ratio of energy output threshold established for renewable microgrid systems, the Commission revised from 12.5[11] to 3.50 gallons the maximum fuel consumption permitted for a renewable microgrid with generating assets limited to solar photovoltaic and diesel-fired generators contained in Section 3.03(A)(3) of the Final Microgrid Regulation.

[10] As detailed in Appendix B of the Final Microgrid Regulation, a CHP system with a Fuel input of 1,000 MMBtu and a useful thermal output of 700 MMBtu (which represents a net input of 300 MMBtu), that has a net electric output of 60 MWh will meet these requirements since its useful thermal output is 70% and its efficiency is 5,000 Btu/kWh. On the other hand, a CHP system with a Fuel input of 1,000 MMBtu and a useful thermal output of 350 MMBtu (which represents a net input of 650 MMBtu), that has a net electric output of 70 MWh will not meet these requirements since its useful thermal output is 35% and its efficiency is 9,286 Btu/kWh.

[11] It should be noted, however, that the original amount of 12.5 gallons was a typographical error. The Commission originally intended for such amount to be 1.25 gallons.

F. §3.04 – Codes and Standards

43. The Final Microgrid Regulation removes references to specific codes and standards and adopts a general requirement that microgrid systems must be compliant with the applicable codes and standards, as those codes and standards are identified from time to time by the Commission through resolution and/or order. Because codes and standards are subject to periodic revisions and changes in order to keep up with technological advances, incorporating specific references in the regulation would make it difficult for the Commission to keep such codes and standards up to date, since doing so would require initiating an amendment process to the existing regulations. Accordingly, the Commission determined to identify the applicable codes and standards through resolution and/or order, which would be revised from time to time to keep up with industry best-practices and prevailing technological advances. The codes and standards that shall apply at this time are identified in Resolution No. CEPR-MI-2018-0007.

G. §3.05 – Interconnection to the Electric Power Grid

44. Similar to the Forms of Demonstrating Compliance, the section authorizing microgrid systems to interconnect with PREPA's Electric Power Grid were spread throughout several articles, applicable to each type of microgrid system. Because they are the same requirement for all systems, incorporating them into a single section provides clarity, reduces duplication and increases simplicity.

45. A microgrid may interconnect with PREPA's system in accordance with applicable regulations adopted by PREPA for self-generating customers of comparable size and voltage. The necessary interconnection regulations shall be developed by PREPA and submitted to the Commission for review. Until an approved interconnection regulation is available, a microgrid may operate in "island" mode. On May 16, 2018, the Commission issued Order No. CEPR-MI-2018-0008 directing PREPA to develop and file for Commission review proposed interconnection regulation, within a term not to exceed 120 days.

46. CAMBIO, ElectrIQ and NPFGC stated that the regulations should be clear regarding the interconnection process with PREPA, since a potential ambiguity of the interconnection process may result in a stumbling block for future grid integration.[12] IEEFA raised concerns regarding whether PREPA would have an obligation to serve interconnected microgrid customers in the event that the microgrid does not serve its own customers.[13] In addition, NPFGC raised an issue that PREPA may need to conduct system redesigning for PREPA assets now integrated into microgrid systems.[14] Tesla recommended that interconnection requirements be defined or detailed with sufficient criteria to ensure that

[12] CAMBIO Comments at 3; ElectrIQ Power Comments at 9; NPFGC Comments at 5-6.

[13] IEEFA comments at 4.

[14] NPFGC Comments at 6.

interconnection costs do not become cost-prohibitive.[15] OIPC also recommends time periods and regulations to interconnect microgrid systems to the PREPA system.[16]

47. The Commission recognizes the importance of having clearly defined interconnection requirements, standards and timetables. Accordingly, as stated above, the Commission has issued an order directing PREPA to develop and submit such interconnection regulation for Commission review within a term of 120 days. The Commission looks forward to commenter views on the proposed PREPA regulation.[17]

H. Articles 4 - Requirements for Cooperative Microgrids

48. In line with the amendments made in Section 2.01 regarding the manner in which microgrid systems are to be classified, the Final Microgrid Regulation amended Article 4 of the Proposed Microgrid Rules so that it is applicable to all Cooperative Microgrids. All requirements, including registration requirements, ownership and sale restrictions, and the provisions related to the allocation of cost among cooperative members are equally applicable to all Cooperative Microgrids, regardless of size.

49. Under the Proposed Microgrid Rules, the requirements established in Article 4 (applicable to Small Cooperative Microgrids) and those established in Article 5 (applicable to Large Cooperative Microgrids) were identical, except for the reporting requirement applicable only to Large Cooperative Microgrids. Therefore, there is no need for bifurcating the requirements applicable to Cooperative Microgrids into two separate articles.

50. The Commission notes that the section on forms of demonstrating compliance included in Article 5 (applicable to Large Cooperative Microgrids) of the Proposed Microgrid Rules was not included as part of the provisions of Article 4 applicable to Small Cooperative Microgrids. The Commission inadvertently omitted from Article 4 of the Proposed Microgrid Rules the requirement that Small Cooperative Microgrids also demonstrate being compliant with the requirements applicable to renewable, CHP or hybrid types of generation. Accordingly, under Article 4 of the Final Microgrid Regulation, both Small and Large Cooperative Microgrids must demonstrate compliance with the requirements applicable to generation resources.

I. Article 5 – Requirements for Third-Party Microgrids

51. In line with the amendments made in Section 2.01 regarding the manner in which microgrid systems are to be classified and the amendments made to Article 4, the Final Microgrid Regulation removed Article 5 of the Proposed Microgrid Rules and replaced it with

[15] Tesla Comments, p. 3.

[16] OIPC Comments, p. 9-10.

[17] It should also be noted that existing PREPA interconnection regulations specifically exclude microgrid systems, thus the need for the development of new, microgrid specific, interconnection regulations.

a new Article 5, which incorporates the requirements applicable to Third-Party Microgrids. The term Third-Party Microgrid encompasses any microgrid systems owned and/or operated for the purpose of selling energy and/or other grid services to customers, including those owned and/or operated by municipalities or other government entities (other than PREPA).

52. Accordingly, Article 5 of the Final Microgrid Regulation removes the portions of Article 6 of the Proposed Microgrid Rules which distinguished between municipal systems and third-party.

J. §5.04 – Rate of Service

53. A number of commenters expressed concerns that the proposed rate cap should be increased, eliminated, or not applied in all situations.

54. NPFGC suggested that the price cap be increased by the approved $0.031 per kWh transition charge, even though no such charge is currently in effect.[18] McConnell Valdés suggests adding to the price cap undefined amounts of fees for interconnection, administration and infrastructure, reserves for improvements, and penalties for non-payment, on the grounds that the added language would allow for the reasonable and fair recovery of expenses, costs, and losses not related to amounts tied to rates.[19]

55. Schneider Electric suggests that Microgrid Systems should have rates that are similar to what the grid typically provides and requests flexibility on the rate restriction, given the numerous challenges in terrain, the nature of the connection to the main grid, the proposed restriction on the use of fuel and gas, and other considerations. [20]

56. ICSE opines that the rules should not establish a cap for prices; rather, it should consider other means for price regulation, limited to when the microgrid is the sole option for the ratepayer or the group of ratepayers for energy security, quality, or reliability. ICSE further argues that fixing a price will limit the capacity of potential microgrid developers that offer services and costs tailored to customer needs (such as a customer paying a higher price for additional services which would not be possible on a predetermined cap).[21]

57. Sunrun asserts that certain projects may offer premium services such as 100 percent renewable generation or an increased level of power quality.[22] ACONER suggests

[18] NPFGC Comments, p. 4.

[19] McConnell Valdés Comments, p. 8.

[20] Schneider Electric Comments, p. 2.

[21] ICSE Comments, p. 2–3.

[22] Sunrun Comments, p. 3.

that the cost of energy not be defined at a certain period; rather, that it be defined by the market and competition and that the average rate at which energy and grid services are sold be based on market forces.[23]

58. Other commenters suggested that the $0.2022 per kWh cap might be too high. Energy Solutions suggests that establishing such a price ceiling is an invitation for all developers to charge the ceiling price to their customers and that a reasonable margin on the return should be established by the FERC type rulings with community participation."[24]

59. The Commission amended the sections related to rate of service for Third-Party Microgrids and removed the $0.2022 rate cap established in Section 6.05 of the Proposed Microgrid Rules.

60. Section 5.04 of the Final Microgrid Regulation replaces the proposed rate cap with a project-specific, cost-based rate. By removing the proposed rate cap and replacing it with a project-specific and cost-based rate, the Commission intends to provide microgrid owners with sufficient flexibility to develop systems which best address the customer's needs and priorities.

61. However, the Final Microgrid Regulation maintains basic consumer-protection requirements, such as that the rates are uniform across customer classes (in those cases in which a system serves different classes of customers—such as residential and commercial) and that such rates are non-discriminatory.

62. Additionally, Third-Party Microgrid owners and/or operators are required to submit for Commission review their proposed rates, along with supporting documentation. In evaluating the proposed rates of each Third-Party Microgrid, the Commission will ensure that rates are just and reasonable, as such standard is used in Act 57-2014, and that they represent the owner and/or operator's actual costs plus a reasonable rate of return.

63. The Commission believes this approach aligns the interests of microgrid owner and/or operators with those of its customers, by granting owner and/or operators flexibility to develop systems tailored to address the customer's needs and preferences, while ensuring the rates charges for energy services are just and reasonable and not discriminatory.

K. §5.05 – Deposits

64. Section 5.05 of the Final Microgrid Regulation maintains the authorization to Third-Party Microgrids to require prospective customers the payment of a deposit. However, the Final Microgrid Regulation simplifies the requirements established in Section 6.06 of the

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[23] ACONER Comments, p. 6.

[24] Energy Solutions Puerto Rico Comments, p. 3.

Proposed Microgrid Rules by only requiring that such deposits be reasonable and uniform across customer classes.

L. §5.08 – Complaint Procedure

65. The Final Microgrid Regulation adds a new Section 5.08 requiring Third-Party Microgrids to develop and notify to customers the procedure through which customers may notify any complaints or grievances (other than bill objections, addressed in Section 5.07) related to the services provided by the microgrid. Rather than imposing a specific procedure on the microgrid owner/operator, Section 5.08 directs the microgrid owner/operator to develop the procedure and notify such to each customer. This provision ensures that customers have an appropriate process to notify any complaints or grievances to the microgrid owner/operator, while providing the owner/operator the opportunity to address such complaints and grievances before they are notified to the Commission for formal resolution.

M. §5.09 – Standard Contract

66. Microgrid owner and/or operators are required to develop a standard contract form which shall apply uniformly throughout customer classes. While Section 5.09 does not require specific terms and conditions, it does identify basic contractual clauses which microgrid owners/operators must include in all of its customer contracts. Section 5.09 of the Final Microgrid Regulation amends Section 6.09 of the Proposed Microgrid Rules to expand on the clauses required to be included in customer contracts. The purpose of Section 5.09 is to ensure customers have the opportunity to fully familiarize themselves with the terms and conditions of the services they are to receive, as well as their rights and obligations under such service agreement. This section, along with its amendments, also seeks to ensure transparency and clarity during the contracting period, so as to reduce the likeliness of complaints or grievances arising from obscure, complex or unintelligible terms and conditions.

N. §5.11 – Contract Length and Exit Requirements

67. IEEFA raises the concern that under Section 6.11 of the Proposed Microgrid Rules, contracts may require a notice period for service termination, not to exceed 60 days, but does not state a minimum.[25] McConnell Valdés states that the time period should be extended to 120 days.[26]

68. Section 5.11 of the Final Microgrid Regulation amends Section 6.11 of the Proposed Microgrid Rules to provide that, in the event of a termination of the contractual agreement, such termination must be preceded by at least a 30-day notice, therefore

[25] IEEFA Comments, p. 3.

[26] McConnell Valdés Comments, p.10.

establishing a minimum notification period and eliminating any constraint on the maximum amount of prior notice allowed.

69. IEEFA also sought clarification that in the event of a default by the microgrid owner that PREPA would be required to be the default provider. Sections 5.11(C)(5) and (6) of the Final Microgrid Regulation address this concern by detailing the rights and responsibilities of the Microgrid Operator in case of a default. In such cases, the Microgrid Operator may exercise due diligence to identify a new operator, ensure customer continue receiving uninterrupted energy services from PREPA, offer customer the option of assuming the ownership of the Microgrid through a Cooperative or provide any other guarantee, such as, but not limited to, performance bonds, which ensure continued and uninterrupted service to customers in the event of a default.

70. IEEFA also suggests that after five years, customers should be able to transfer their contract to the subsequent homeowner.[27]

71. The Commission clarifies that the provisions related to the payment of an exit fee applies to situation in which the existing customer wishes to terminate his/her agreement with a microgrid system owner and/or operator. Nothing in the Final Microgrid Rules prevents or limits the customer's ability to transfer his/her contract for microgrid service to a new customer. For example, a customer who sells his/her home may freely transfer his/her contract for microgrid services to the new homeowner, without the need for payment of an exit fee if such transfer occurs within the first five years of the contract.

O. Rate Review

72. McConnell Valdés suggests that the Commission and customers be prohibited from reviewing microgrid rates for three years after registration of the microgrid, but that "system owners" be allowed to petition for rate review "at any moment after approval of registration."[28]

73. The Commission believes a microgrid system owner and/or operator has the capability of proposing initial rates that will be sufficient to recover costs plus a reasonable rate of return for the first three years of the system's operation. Moreover, the Commission does not agree that there should be a prohibition on the customers or the Commission from exercising the same rights that the system owners seek.

P. Article 6 – Registration Process

74. Under Article 7 of the Proposed Microgrid Rules, the registration of a microgrid system occurred after the system had been designed and built. Under Article 6 of the Final Microgrid Regulation, the Commission adopted a two-tier registration process. The

[27] IEEFA Comments, p.3.

[28] McConnell Valdés Comments, p. 11.

first part of the process encompasses the initial registration of the system. During this step, the microgrid's owner and/or operator provides the Commission the information identified in Sections 4.02 (applicable to Cooperative Microgrids) and 5.03 (applicable to Third-Party Microgrids), the Commission then evaluates said information and, if the information is deemed complete and complaint, the Commission will grant registered status to the system.

75. The second step consists of the filing of compliance certifications once the microgrid system has been fully built. Filing of these compliance certifications is pre-requisite for the microgrid to be authorized to begin operation. However, once such information has been filed, the microgrid may begin operation without the need for further Commission authorization. The filing of the certifications shall be considered as a presumption that the microgrid was built and will operate within the parameters initially identified in the application for registration. A microgrid system may not begin operation prior to filing such certifications with the Commission. The Commission will review the certifications provided and will notify the microgrid owner/operator the result of such evaluation.

76. The purpose of this amendment is to reduce the regulatory impediment for microgrid systems to begin operation. The Commission will rely on the good faith of microgrid owners and/or operators certifying that the microgrid systems were built consistent with the information and designs originally submitted to the Commission. However, if, as part of the Commission's evaluation of the certifications provided by the microgrid owners and/or operators or as part of any investigative proceeding, the Commission determines that a system was built or is being operated in a manner which substantially diverge from the information originally provided to the Commission, the Commission may order such owner and/or operator to temporarily suspend operations until a final determination is made.

77. The Commission believes that these amendments address commenter concerns that the registration process takes place following the investment of capital for the project, but at the risk of not having the project approved by the Commission.[29]

Q. Article 7 – Exemptions

78. Several commenters raised issues that demonstrated that an exemption or modification to the rules may be appropriate.[30] As originally proposed, Article 8 (now Article 7 of the Final Microgrid Regulation) addressed only exemptions from Article 2. The Commission concurs that there could be other circumstances that may justify an exemption from a specific regulation. The Commission therefore has broadened the language in Article 7 to cover the ability of any party to file for an exemption to any provision of the Final Microgrid Regulation. Moreover, this opportunity to file for an exemption shall be extended

[29] McConnell Valdés Comments, p. 13.

[30] See for example, Institute for Energy Economics and Financial Analysis (IEEFA), p. 2.

to after a microgrid is in operation in the event of an anticipated or proposed change in circumstances.

IV. Other Issues

A. The Concept of Microgrid Owner and Microgrid Operator

79. In the context of the Final Microgrid Regulation, the term "owner" refers to either the Person(s) who directly purchase the microgrid equipment or the Person(s) who lease the equipment from a microgrid equipment vendor or receive third-party financing services from such vendor. In both cases, the Person(s) making a monetary disbursement for the right to use the equipment is the Person(s) considered as the owner of the microgrid for purposes of the Final Microgrid Regulation. The entity selling or leasing the equipment, or that offers third-party financing services to the microgrid owner, has no obligations under the Final Microgrid Regulation, provided such entity does not offer Energy Services and/or Other Grid Services, as such terms are defined in the Regulation, or does not otherwise act as Microgrid Operator.

80. The Microgrid Operator, on the other hand, refers to the Person(s) who operate the system. In some cases, the Microgrid Owner may also be the Microgrid Operator. In other cases, the Microgrid Owner may outsource such function to a third-party, who then becomes the Microgrid Operator. The Microgrid Operator is the person responsible for overseeing the operation of the microgrid equipment, providing the contracted services to the customers (or members, in the case of a cooperative microgrid) and customer billing, when applicable. The majority of the responsibilities during the operational phase of a microgrid fall on the Person designated as the Microgrid Operator.

B. Cost-Benefit Analysis

81. Bayamón argues that Section 2.5 of the Puerto Rico Uniform Administrative Procedure Act requires that any new regulation include a justification and a cost-benefit analysis.[31] Bayamón submits that various aspects of the regulations have potential system cost and economic feasibility impacts.

82. The Commission finds that these concerns are not well-founded. The overall benefit of the Final Microgrid Regulation is that they empower customers to self-generate, in a manner that provides economic benefits to those customers, not only in terms of the potential cost of electricity, but also in providing businesses with the ability to operate where electric service is not available or not reliable. The availability of a microgrid option is fully consistent with existing public policy under Act 57-2014, the Governor's statements and

[31] Bayamón Comments, p. 10

PREPA's comments on the importance of microgrids.[32] Given current circumstances, including continued outages, PREPA's limited resources, and volatile fossil fuel costs, among others, the ability to receive power from a microgrid outweighs any costs that may arise from complying with these regulations. The alternative of not having power, given the current state of PREPA's grid, is clearly sufficient to meet a cost-benefit analysis requirement.

83. Given the outages experienced during hurricanes Irma and Maria and the need to diversify energy resources, reduce dependency on fossil fuel and foster energy independence as a choice, any burden created by the need to comply with these requirements is nominal when compared to the benefits derived, by the customer, on one hand, whom receives greater control over his energy needs, and microgrid developers, on the other, who are able to make informed and objective investment decisions based on a predictable regulatory framework.

84. Furthermore, these rules do not impose, nor intend to impose, undue burden on microgrid owner and/or developers, because most of the information to be provided to the Commission is information they would otherwise need to produce or provide, either as part of the design and development process or as part of permitting procedures before other government entities. Additionally, the interests of microgrid developers are also aligned with the interest of consumers, by requiring transparency and full disclosure of all information, rights and responsibilities, so that customers and microgrid owners/developers are aware of their rights and obligations.

85. Finally, many of the amendments described in Part III above were made with the purpose of providing greater flexibility, reducing unnecessary requirements, and providing both developers and customers greater access to microgrid service alternatives and markets.

C. Compliance with Other Regulations

86. Several parties pointed out that there are many other requirements for a microgrid owner or operator to comply with, including siting, construction, and environmental concerns.[33] The Commission emphasizes here that meeting the requirements of these microgrid rules does not, in any way, exempts any microgrid owner/operator from any other requirements of the Commonwealth and federal laws and regulations, and it is the

[32] Act 57, §2,6; "I am 100 percent backing renewables. This is an opportunity to make microgrids in Puerto Rico so they can be sustained in different areas." Statement of Governor Ricardo Rosselló to the Senate Energy and Natural Resources Committee, November 14, 2017. https://www.vox.com/energy-and-environment/2017/10/19/16431312/elon-musk-richard-branson-clean-energy-puerto-rico-solar-batteries-microgrid. "Build Back Better: Reimagining and Strengthening the Power Grid of Puerto Rico," prepared by PREPA et. al. for Governor Rosselló, December 2017. PREPA Amended & Restated Fiscal Plan, January 24, 2018; PREPA Comments, p.1.

[33] Ad Hoc Group of PREPA Bondholders (Ad Hoc Bondholders), p. 12.

responsibility of every microgrid owner and/or operator to ensure that its microgrid project is in compliance with all Commonwealth and federal rules and regulations, including any applicable local rules and regulations. Accordingly, the Commission has clarified this point in Section 1.17.

87. Further, several parties commented that the Commission should play a role in, or setting forth policies for, determining appropriate siting for microgrids.[34] Siting issues are beyond the scope of the Commission's jurisdiction and should be addressed before the appropriate government agencies.

D. Qualified Hydropower

88. The Municipality of Bayamón commented that the definition of Alternative Renewable Energy Resource contained in the Proposed Microgrid Regulation excludes the term "Qualified Hydropower" and that such exclusion is contrary to Act 133-2016.[35]

89. Qualified Hydropower is included in the definition of Sustainable Renewable Energy Resources. The Commission used the term "Sustainable Renewable Energy", defined in Act 82-2010, as amended by Act 133-2016, as the basis for defining this term in both, the Proposed Microgrid Rules and the Final Microgrid Regulation. As such, Qualified hydropower is a source of generation expressly contemplated in the Final Microgrid Regulation.

E. Use of PREPA Infrastructure

90. The Proposed Microgrid Rules contemplated microgrid systems purchasing or leasing PREPA equipment (such as lines, poles, etc.) so that said equipment would be used by the microgrid system. The Proposed Microgrid Rules then established the procedure to determine the fees to be paid to PREPA for the purchase or lease of such equipment.

91. PREPA raises concerns as to whether the Commission can order the sale or lease of PREPA property, and whether those actions would require the approval of the Federal Court, given PREPA had filed for PROMESA Title III restructuring.[36] Similarly, the Ad Hoc Bondholders argued that the PREPA 1974 Trust Agreement, under which PREPA's bonds have been issued, requires bondholder consent for the sale or lease of property owned by PREPA.[37]

92. The Commission determined to remove from the Final Microgrid Regulation the provisions related to the use of PREPA infrastructure. The Commission's original intention

[34] See for example, CAMBIO Comments, p. 3.

[35] Bayamón Comments at p. 9.

[36] PREPA Comments at 5.

[37] Ad Hoc Bondholders Comments at 2.

was to facilitate the development of microgrid systems by allowing owners and/or operators access to existing infrastructure, therefore reducing the infrastructure costs while providing PREPA a source of revenue for equipment that, given the development of the microgrid, may be under-utilized or not used at all.

93. However, questions related to maintenance responsibilities, responsibilities for replacing infrastructure due to *force majeure* events, adequate pricing of use fees, possible changes in design required for isolation of the equipment, led the Commission to conclude that requiring PREPA to provide access to such infrastructure was not appropriate at this time.

94. The Commission will monitor market development and will determine at a later time if further action on this matter is required.

Be it notified and published.

Ángel R. Rivera de la Cruz
Associate Commissioner

José H. Román Morales
Associate Commissioner
Interim Chairman

CERTIFICATION

I hereby certify that the majority of the members of the Puerto Rico Energy Commission has so agreed on May 16, 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 May 16, 2018.

María del Mar Cintrón Alvarado
Clerk