

**GOVERNMENT OF PUERTO RICO
PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU**

IN RE: HIGHLY EFFICIENT FOSSIL
GENERATION DEFINITION

CASE NO.: CEPR-MI-2016-0001

SUBJECT: Resolution adopting the definition of the term “Highly Efficient Fossil Fuel Generation”, for purposes of Act 60-2019.

RESOLUTION

I. Introduction

On November 12, 2020, the Energy Bureau of the Puerto Rico Public Service Regulatory Board (“Energy Bureau”) issued a Resolution (“November 12 Resolution”) in the instant case proposing a definition for the term “Highly Efficient Generation”, for the purposes of Act 60-2019.¹ The Energy Bureau noted that the proposed definition issued as part of the November 12 Resolution should not be construed as a modification of the definition of the term “Highly Efficient Fossil Generation”, as established in the March 20, 2019 Resolution in the instant case.

As part of the process, the Energy Bureau invited all interested parties to submit their written comments regarding the proposed definition, on or before December 14, 2020.

Through this Resolution, the Energy Bureau adopts the definition of the term “Highly Efficient Generation”, for purposes of Act 60-2019, as described herein.

II. Analysis of Public Comments

On December 14, 2020, the Energy Bureau received written comments from the Puerto Rico Electric Power Authority (“PREPA”), AB Energy USA, LLC (“AB”), the Puerto Rico Manufacturer’s Association (“PRMA”) and a group of commenters comprised by 2G Energy, Tropigas, Crowley, AM Electric, Green Fuels, JD Repair Services, Antilles Power, Every Watt Matters and CRB Caribe (jointly “Commenters”).

The comments presented can be addressed from the emissions requirement standpoint and the operational requirement standpoint. Below the discussion.

(i) Comments on Emissions Requirement:

As part of the comments received, PRMA suggested this requirement be removed. PRMA states that all Combined Heat and Power (“CHP”) units are less contaminating than other fossil fuel generating systems since the combined energy generated replaces the fossil fuel that would have been consumed. PRMA also suggests that the definition should measure emissions of CO₂ in terms of lbs/MBTU instead of lbs/MWh, as included in the proposed definition. Further, PRMA suggests propane gas and/or Synthetic Natural Gas as part of the standard since a significant number of CHP units in Puerto Rico operate with propane gas.

The measurement of CO₂ emissions is a key element in the operation of combustion units. Therefore, the requirements established based upon the U.S. Environmental Protection Agency’s Emissions & Generation Resource Integrated Database (“eGRID”) (or successor source) are considered reasonable for the definition of the term “Highly Efficient Generation”, adopted pursuant to Act 60-2019.

¹ Known as the *Puerto Rico Incentives Code*, as amended.



(ii) Comments on Operational Requirement:

As part of the comments received, PREPA suggests that the Energy Bureau should increase the yearly unit or system total cost of generating electricity, established in dollars per MWh. PREPA states that based on the current retirement projections, without the installation of a new, natural gas-fired combined cycle plant, the operational requirement of \$100/MWh total cost of generating electricity cannot be met. PREPA states that the use of diesel fuel can increase the system total cost to about \$140/MWh. We must emphasize that focus of the revision is to establish the definition of the term "Highly Efficient Fossil Generation" for the purposes of Act 60-2019. The Energy Bureau will not revise at this moment, the general definition of the term "Highly Efficient Fossil Generation", as established in in the March 20, 2019 Resolution, as PREPA requested.

On the other hand, the Commenters stated that the proposed definition for CHP systems with regards to the operational requirement is contradictory. They expressed that as the electrical efficiency increases, the thermal efficiency will decrease. The Commenters state that the proposed definition will hinder the implementation of increasingly electrically efficient engines and that CHP is mainly to maximize the overall efficiency of the asset.

Further, the Commenters argue that having a fossil-fueled generation asset with an average annual heat rate of less than 8,200 BTU/kWh is not achievable. The Commenters propose that the heat rate value be set at equal or less than 10,000 BTU/kWh. The value, as proposed, shall be determined using the "high heat value" and the net electrical output of the given asset.

AB comments that the proposed definition fails to consider the thermodynamic linkage between electrical and thermal efficiencies, does not consider performance parameters of the best available technologies and does not clearly define relevant reference conditions. AB suggests for the Energy Bureau to review and acknowledge the EU (Europe) High Efficiency Methodology for CHP units.

PRMA suggests the Energy Bureau to replace the thermal and electrical efficiencies established in the proposed definition by a single Total System Efficiency. PRMA states that the use of the Total System Efficiency Standard would enable the industry to extract the full potential of CHP as viable, environmentally friendly, and cost-efficient alternative to energy generation. Further, PRMA states that the requirement for CHP units for the fuel input minus useful thermal energy output to be no more than 7,000 BTU/kWh should be eliminated. PRMA states that having a single efficiency standard should be enough to corroborate a CHP unit's efficiency. PRMA also comments that for a CHP unit with an engine or turbine of less than 10 MW, the heat rate will range from 8,000-9,000 BTU/kWh. PRMA states that said unit will not meet the 7,000 BTU/kWh standard.

The Energy Bureau clarifies that any electric service to be provided using PREPA's electric grid must comply with the "Highly Efficient Fossil Generation" definition, as established in the March 20, 2019 Resolution issued in the instant case. For non-CHP generation units not connected to the electric grid, the Energy Bureau revised the proposed definition such that the generation assets must have an annual heat rate of less than 8,500 BTU/kWh.

Further, the Energy Bureau revised the proposed definition to establish that CHP systems must comply with the *Federal Energy Regulatory Commission (FERC)* efficiency standard as stated in 18 CFR § 292.205, *Criteria for Qualifying Cogeneration Facilities* (a)(2)(i). This determination is consistent with Act 60-2019.

III. Definition of Highly Efficient Generation for the purposes of Act 60-2019

The Energy Bureau hereby defines the term "Highly Efficient Generation", for the purposes of Act 60-2019 as follows:



For the purposes of Act 60-2019, a generation unit or system is considered “Highly Efficient” if it meets the Emissions Requirement and the Operational Requirement as follows:

(A) Emissions Requirement:

The average annual rate of carbon dioxide emissions from the generating unit, as measured in pounds per megawatt-hour (lbs/MWh), is lower than the United States nationwide average for plants with the same primary fuel and primary fuel generation category as reported in the U.S. Environmental Protection Agency’s Emissions & Generation Resource Integrated Database (“eGRID”) (or successor source) for the most recent year in which data is available. The Energy Bureau may modify the referenced limits based on updated to the eGRID (or successor) data.

The average annual rate of carbon dioxide emissions for the most recent year in which data is available are as follows:

Fuel Type	Average annual rate of CO ₂ emissions (lbs/MWh) ²
Coal	2,187
Residual Fuel Oil	1,930
Diesel Fuel	2,681
Natural Gas	1,433

(B) Operational Requirement:

(1) For fossil-fueled generation assets that use the electric grid to provide service to their respective clients, may it be in the form of a Power Purchase and Operating Agreement (“PPOA”) with PREPA or its successor, or with a particular customer or customers through the wheeling mechanism:

i. The yearly unit or system total cost of generating electricity cannot exceed \$100/MWh (i.e. \$0.10/kWh) adjusted to 2018 dollars. The cost per MWh shall be the total amount billed by the seller divided by the yearly net electrical power output of the unit or system.

ii. For Combined Heat and Power (“CHP”) systems:

(a) The total system efficiency shall be at least 80%. The total system efficiency (η_o) of a CHP system is computed as the sum of the net useful electric output W_e and the net useful thermal output $\sum Q_{TH}$ divided by the total fuel energy input $Q_{Fuel\ in}$, as shown below:

$$\eta_o = \frac{W_e + \sum Q_{TH}}{Q_{Fuel\ in}}$$

(2) For fossil-fueled generation assets that provide service to its clients on site, may it be disconnected from the grid or connected for the purpose of exporting excess energy, or that provide service to its clients by using other means than the electric grid:

i. For Combined Heat and Power (“CHP”) systems:

(a) System must comply with the *Federal Energy Regulatory Commission (FERC)* efficiency standard as stated in 18 CFR § 292.205, *Criteria for Qualifying Cogeneration Facilities* (a)(2)(i).

² Source: “egrid2019_data_v2.xlsx”, Tab “PLNT19”, Column “BA”, “Plant annual CO2 total output emission rate (lb/MWh)”, available at <https://www.epa.gov/egrid/download-data>, visited on November 12, 2021.

[Handwritten signatures and initials in blue ink]



(b) It must also comply with the condition described in 18 CFR § 292.205 (d)(1) to (d)(3).

ii. For all other fossil-fueled generation assets:

(a) The average annual heat rate is less than 8,750 BTU/kWh.

For each “Highly Efficient Energy Producer”, as such term is defined in Act 60-2019, the percentage of fossil-fueled generation considered highly efficient for any reporting year is calculated as follows:

$$\text{Highly Efficient Generation (\%)} = \frac{\text{Total kWh from Highly Efficient Units}}{\text{Total kWh from all fossil – fueled generating units}} \times 100\%$$

If the percentage of fossil-fueled generation considered highly efficient is greater than the sixty percent (60%) for the reporting period, then it could be construed that the “Highly Efficient Energy Producer” met the requirements established in Act 60-2019.³

Be it notified and published.


Edison Avilés Deliz
Chairman


Angel R. Rivera de la Cruz
Associate Commissioner


Lillian Mateo Santos
Associate Commissioner


Ferdinand A. Ramos Soegaard
Associate Commissioner


Sylvia B. Ugarte Araujo
Associate Commissioner



³ As an example, assume a person owns two fossil-fueled assets with an installed capacity of 100 MW and 50 MW, respectively. Assume the 100 MW asset produces 438 GWh in a given year and meets the definition of Highly Efficient Generation and assume the 50 MW asset produces 219 GWh in the same year but doesn't meet the definition. Then, for this owner, the percentage of fossil-fueled generation considered highly efficient for that particular year equals to $438 \text{ GWh} / (438 \text{ GWh} + 219 \text{ GWh}) = 438 / 657 = 0.667 = 66.7\%$. In this case, the owner meets the highly efficient generation standards, therefore may be considered a “Highly Efficient Energy Producer”, for the purposes of Act 60-2019. If the person only owns one generation asset, then such asset must meet the requirements of the Highly Efficient Generation definition in order to be considered a “Highly Efficient Energy Producer”, for the purposes of Act 60-2019.

CERTIFICATION

I hereby certify that the majority of the members of the Puerto Rico Energy Bureau has so agreed on November 16, 2021. I also certify that on November 16, 2021 a copy of this Resolution was notified by electronic mail to the following: brodriguez@diazvaz.law and jmarrero@diazvaz.law. I also certify that today, November 16, 2021, I have proceeded with the filing of the Resolution issued by the Puerto Rico Energy Bureau.

For the record, I sign this in San Juan, Puerto Rico, today November 16, 2021.



Sonia Seda Gaztambide
Clerk

