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Docket Case No. CEPR-MI-2016-0001 Resolution

1 message

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Dear Commissioners:

Attached you will find the Puerto Rico Manufacturers Association's position related to Docket Case No. CEPR-MI-2016-0001 Resolution is initiating the process for the adoption of a definition of the term "Highly Efficient Fossil Fuel Generation", for the purposes of Act 60-2019.

Feel free to contact us if you need further information or clarification.

Cordially,

Priscilla Vázquez

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December 14, 2020

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Docket Case No. CEPR-MI-2016-0001 Resolution is initiating the process for the adoption of a definition of the term "Highly Efficient Fossil Fuel Generation", for the purposes of Act 60-2019.

Dear Commissioners:

We hereby express the Puerto Rico Manufacturers Association's position related to the referenced matter.

I. INTRODUCTION:

A. About PRMA

The manufacturing sector is the leading and most vital, productive economic sector within the Puerto Rico economy. It includes pharmaceuticals, electronics, apparel, and food products. In 2018, around 47.3 percent of the total value added to Puerto Rico's gross domestic product (GDP) was generated by the manufacturing sector. It generates employment for close to 19% of the active labor force. It is mostly responsible for the island's finished products' export. Furthermore, it generates approximately 3 indirect jobs for every position it creates, and it is also substantially responsible for a large portion of Puerto Rico's service sector.

The Puerto Rico Manufacturers Association ("PRMA") is a private, voluntary, non-profit organization established in 1928 with the purpose of uniting all of Puerto Rico's manufacturers and service industries into a strong and effective body in order to further their mutual interests as they relate to the private and public sectors of the Commonwealth of Puerto Rico. Its address is Centro Internacional de Mercadeo, Torre II, Oficina 702; 90 carretera 165, Guaynabo, Puerto Rico 00968.

Among its objectives and purposes, the PRMA serves as a forum through which the manufacturing and service industries come together in a strong and effective organization to promote the strengthening and development of local industry and attract manufacturing industries to Puerto Rico. In addition, it also has the task of promoting the integration of the economy of Puerto Rico and to promote the development of the manufacturing and services sectors, managed to achieve the expansion of business opportunities.

B. Combined Heat and Power ("CHP")

As indicated by the environmental Protection Agency ("EPA"), Combined Heat and Power ("CHP") may be described as follows:

"CHP is an energy efficient technology that generates electricity and captures the heat that would otherwise be wasted to provide useful thermal energy—such as steam or hot water—that can be used for space heating, cooling, domestic hot water and industrial processes. CHP can be located at an individual facility or building or be a district energy or utility resource. CHP is typically located at facilities where there is a need for both electricity and thermal energy.

Nearly two-thirds of the energy used by conventional electricity generation is wasted in the form of heat discharged to the atmosphere. Additional energy is wasted during the distribution of electricity to end users." <https://www.epa.gov/chp/what-chp>

Since CHP systems require less fuel to produce the same energy output as conventional systems, CHP systems can reduce emissions of CO₂ and air pollutants, such as nitrogen oxides (NO_x) and sulfur dioxide (SO₂). As cited by the EPA, a 10 MW CHP unit produces an annual CO₂ Savings 42,506 Tons and achieves annual energy savings of 316,218 MMBtu.

https://www.epa.gov/sites/production/files/2015-07/documents/combined_heat_and_power_frequently_asked_questions.pdf

Local industries have been considering installing and some have already installed, CHP units, in order to: a) reduce total energy costs, b) control the quality of its electric power, c) manage and enhanced the efficiency of their energy consumption, d) acquire redundancy for their power requirements and e) reduction of CO₂ emissions and other environmental advantages.

According to the US Department of Energy, Puerto Rico holds a substantial potential for the establishment of hundreds of CHP units for industrial and high volume commercial use.

<https://betterbuildingssolutioncenter.energy.gov/sites/default/files/tools/Puerto%20Rico.pdf>

Most of the generation of CHP units in Puerto Rico are of the tri-generation type or combined cooling, heat and power generation ("CCHP"), in a process by which some of the heat produced by a co-generation plant is used to generate chilled water for air conditioning or refrigeration. This is accomplished by adding an absorption chiller, that uses heat instead of compressors and refrigerant gases to cool, is linked to the CHP unit to provide this functionality. Thus, the CHP unit will be

producing not only electricity, but also steam and chilled water; becoming a CCHP unit.

The new Code of Incentives, Act 60-2019 considers "waste heat" energy as an alternative renewable energy source, for purposes of such Act. See Act 60-2019, Section 1020.06 (7) (iv) and also considers High-Efficiency Energy Producers as eligible entities under Section 2071. Therefore, the definition of the term "High-Efficiency Production" should be one compatible both with the policy objectives of Act 60-2019 but also with those embodied in Act 17-2019, thus facilitating the expansion of co-generation facilities and micro-grids.

II. SPECIFIC RECOMMENDATIONS

The Bureau has granted until December 14, 2020, for any interested parties to submit comments relating to the referenced matter. We believe that the proposed definition of "Highly Efficient Generation" as it applies to Combined Heat and Power ("CHP") units should be amended as hereinafter indicated.

SECTION "A" EMISSIONS REQUIREMENTS

First, the Emissions Requirements section (A) should be deleted for an obvious reason; all CHP units are inherently less contaminating than other fossil fuel generating systems for one basic reason, the combined energy generated replaces the fossil fuel that would have otherwise been consumed in a Boiler (steam, for instance) or refrigeration equipment (chilled water for a/c or industrial cooling). As precisely explained by the Environmental Protection Agency:

"Amid growing concerns about energy security, energy prices, economic competitiveness, and climate change, combined heat and power (CHP) have been recognized for its significant benefits and the part it can play in efficiently meeting society's growing energy demands while reducing environmental impacts....

"The CHP system's thermal output displaces the fuel normally consumed in and emissions emitted from on-site thermal generation in a boiler or other equipment, and the power output displaces the fuel consumed and emissions from grid electricity"

"2.1 How CHP Systems Save Fuel and Reduce CO2 Emissions

CHP's efficiency benefits result in reduced primary energy use and thus lower CO2 emissions. Figure 2 shows the efficiency advantage of CHP, compared to SHP.⁹ CHP systems typically achieve total system efficiencies of 60 to 80 percent compared to about 45 to 55 percent for SHP. As shown in Figure 2, CHP systems not only reduce the amount of total fuel required to provide electricity and thermal energy, but also shift where that fuel is used. Installing a CHP system on site will generally increase the amount of fuel that is used at the site, because additional fuel is required to operate the CHP system compared to the equipment that otherwise would have been used on site to produce needed thermal energy."

See Exhibit A EPA, Combined Heat and Power Partnership: *Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems*, https://www.epa.gov/sites/production/files/2015-07/documents/fuel_and_carbon_dioxide_emissions_savings_calculation_methodology_for_combined_heat_and_power_systems.pdf

Therefore, it is our understanding that a Commonwealth imposed additional environmental standard, beyond the existing federal emissions regulations applicable to all reciprocating or turbine engines used in CHP units, has no place in the definition of highly efficient generation. Such additional regulations would only discourage additional CHP units in Puerto Rico.

In the event that the Bureau decides to use an environmental criteria, contrary to our suggestion, we propose the following. First, it should be noted that the proposed environmental section chart indicates the amounts of pounds of CO₂ per million watt hours (Lbs/MWh) emitted by several fuel sources.

The data source used relates to grid size mayor generating units, in the dozens of Mega Watts (MW) range; and are totally inapplicable to on site industrial/commercial CHP units.

If an environmental standard is to be adopted, it should be based on pounds of CO₂ emitted per million British Thermal Units (BTU) of energy for various fuels instead. Accordingly, if the end product of most CHP units includes steam and chilled water, with a specific economic value for each; then the standard of pounds of CO₂ emitted per million British Thermal Units (BTU) of energy (Lbs CO₂/MBTU) would be a much more proper one, since it takes into account not just the production of electricity, but also the production of other sources of energy like steam and chilled water. These other sources will reduce the user's expenditures on other fuels or electric sources; and such savings must be factored in any definition used by the Bureau relating to CHP units.

Second, the standard must include propane gas (HD-5) and/or Synthetique Natural Gas (air-propane) due to the fact that a significant number of CHP on-site units operating in Puerto Rico are fueled by propane gas. The proposed chart excludes propane since it is not a major fuel source for grid sized generating units in the USA. (unlike other countries in Europe, Asia and Latin America) Propne is included however in EIA's data related to pounds of CO₂ emitted per million British Thermal Units (BTY) of energy for various fuels, as shown below:

According to the Energy Information Administration, the following are the values of CO₂/MBTU per fuel:

Pounds of CO₂ emitted per million British thermal units (Btu) of energy for various fuels:

Coal (bituminous)	205.7
Coal (lignite)	215.4
Coal (subbituminous)	214.3
Diesel fuel and heating oil	161.3
Gasoline (without ethanol)	157.2
Propane	139.0
Natural gas	117.0

<https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>
and see:

<https://www.americangeosciences.org/critical-issues/faq/how-much-carbon-dioxide-produced-when-different-fuels-are-burned>

Third, any standard must take into account the fact that CHP units, as previously stated: "thermal output displaces the fuel normally consumed in and emissions emitted from on-site thermal generation in a boiler or other equipment, and the power output displaces the fuel consumed and emissions from grid electricity". If the substantial fuel consumption and energy savings inherent to a CHP unit are not factored in into any environmental CHP standard, a CHP unit may fall short of such standard, and the Bureau would only be discouraging instead of incentivizing more CHP units.

Fourth, such standard should not require lesser emissions than average CO2 US emissions per MM/BTU for a specific fuel source. There is no need for such an action, as CHP and CCHP operations are inherently cleaner and more environmentally friendlier than individual boilers (for steam) and conventional grid-electric driven chillers (for A/C and other cooling uses). It would be more than enough if the selected fuel complies with national standards.

SECTION (B) (2) I OPERATIONAL REQUIREMENTS FOR CHP UNITS

Subsection (a) "the useful thermal output of the system is no less than 50% of the total energy output"

First, the useful thermal energy output for CHP units in subsection (B) should be amended in order to clarify that the efficiency rating is based on the Total System Efficiency method described by the Environmental Protection Agency. ("EPA")

Such method according to the EPA, is: "the measure used to compare the efficiency of a CHP system to that of conventional supplies (the combination of grid-supplied electricity and useful thermal energy produced in a conventional on-site boiler). If the objective is to compare the CHP system energy efficiency to the efficiency of a site's conventional supply, then the total system efficiency measure is likely the right choice." www.epa.gov/chp/methods-calculating-chp-efficiency.

By doing so, the Bureau's definition of a highly efficient generation would be entirely compatible with the type of CHP operations most commonly used in Puerto Rico and therefore more likely to be subject to request for exemptions and credits under Act 60-2019. The local industry sites include not just electricity, but steam and chilled water, and in some instances CO2 for specific purposes, such resources directly impact the cost operational structures of industries in Puerto Rico. Also, large commercial users with a need to cool large areas, who have acquired or might acquire CHP units, will only realize a substantial benefit from the CHP operation if it is able to act also as a CCHP. See also, <https://www.epa.gov/chp/chp-benefits>

Hence, an electricity only standard will severely limit the possibilities for local industries and commercial operations to benefit of CHP units. On the other hand, the adoption of a *Total System Efficiency Standard* would enable our industry to harvest the full potential of CHP as a viable, environmentally friendly and cost-efficient alternative to energy generation.

We suggest the following language: "the useful total thermal output of the system, including electricity, steam, chilled water for cooling purposes and/or CO2 emissions for industrial use; or Overall CHP efficiency, (HHV) is no less than 50% of the total energy output"

Subsection (b) "the fuel input minus useful thermal energy output is no more than 7,000 BTU/kWh of generator output"

This wording should also be deleted due to the fact it only shows that 7,000 BTU's are needed to produce one kWh, it is the equivalent of conversion efficiency slightly below 50%.

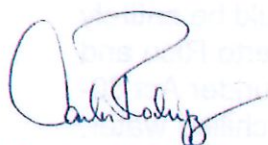
https://www.eia.gov/todayinenergy/includes/sparkspread_explain.php Thus, this benchmark unnecessarily duplicates the efficiency standard of Section (B) (2) (a).

We believe that a single efficiency standard should be more than enough to corroborate the CHP unit's efficiency. To add a second inconsequential standard will only lead to confusion and even erroneous interpretation by non-technical personnel.

Furthermore, it must be said that the engine or turbine components of CHP units of less than 10 MW have a heat rate ranging from 8,000 – to 9,000 BTU/kWh and will never be able to meet the 7,000 BTU/kWh standard; since this standard alone only considers the BTU's required to generate electricity, excluding steam and chilled water. Lower heat rates and therefore, higher efficiency percentages, are only achieved by factoring in all of the usable energy generated such as steam and chilled water.

Finally, since the adopted efficiency standard will likely be applied by non-technical personnel; we suggest that the unit's efficiency, for purposes of Act 2019-60, should be certified by an independent licensed engineer in order to assure a uniform technically sound application of the efficiency standard.

Sincerely,



Carlos M Rodriguez