

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

NEPR

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**IN RE: REQUEST FOR APPROVAL OF
AMENDED AND RESTATED POWER
PURCHASE AND OPERATION
AGREEMENT WITH ECOELÉCTRICA
AND GAS SALE AND PURCHASE
AGREEMENT WITH NATURGY
APROVISIONAMIENTOS, SA**

CASE NO.: NEPR-AP-2019-0001

**SUBJECT: MOTION FOR
RECONSIDERATION AND PETITION
FOR INTERVENTION**

**DECLARATION OF AGUSTÍN A. IRIZARRY RIVERA Ph.D., P.E. IN SUPPORT OF
MOTION FOR RECONSIDERATION AND PETITION FOR INTERVENTION**

I, Agustín A. Irizarry Rivera, under penalty of perjury, declare as follows:

1. I am a certified professional engineer in Puerto Rico, licence number 12342, since 1991 and an active member of Colegio de Ingenieros y Agrimensores de Puerto Rico. I am Professor in the Electrical and Computer Engineering (ECE) Department at the University of Puerto Rico Mayaguez Campus (UPRM, for its Spanish acronym). My business address is Road 348, km. 9.9, Poblado Rosario, San German, Puerto Rico, 00683.
2. I obtained my bachelor's degree, Magna Cum Laude, at the University of Puerto Rico, Mayaguez Campus (UPRM) in 1988; a masters at the University of Michigan, Ann Arbor in 1990; and a Ph.D. at Iowa State University, Ames in 1996, all in electrical engineering. My Ph.D. is in electric power systems.
3. Since 1997, I have been a Professor at the Electrical and Computer Engineering (ECE) Department at UPRM where I teach graduate and undergraduate courses such as: Electric Systems Analysis, Fundamentals of Electric Power Systems, Power System Analysis, Electric Machines, Electrical Systems Design, Advanced Energy Conversion, Power Systems Dynamics and Control and Transmission and Distribution Systems Design.
4. I conduct research in the topics of: power systems dynamics and operation, renewable energy and how to adapt the existing power grid to add more of these resources in our energy portfolio.

5. I have served as a consultant on renewable energy and energy efficiency projects to Puerto Rico's government agencies, municipalities, private developers, and consulting firms, both in and outside Puerto Rico. I have also served as an expert witness in civil court cases involving electric hazard, shock or electrocution.
6. I am an author or coauthor of over 40 refereed publications, including two book chapters (see complete list in the CV section), and I have been a licensed professional engineer in Puerto Rico since 1991, and a member of the Institute of Electrical and Electronics Engineers (IEEE).
7. I have received several awards and honors: Distinguished Engineer 2013 from Puerto Rico's Professional Engineers Society (CIAPR) and Distinguished Electrical Engineer 2005 from the Electrical Engineering Institute of CIAPR in recognition of services rendered to the profession and outstanding professional achievements in electrical engineering, the 2009 Distinguished Alumni Award from UPRM Alumni Association, the 2004 Professional Progress in Engineering Award from Iowa State University, in recognition of outstanding professional progress and personal development in engineering as evidenced by significant contributions to the theory and practice of engineering, distinguished service rendered to the profession, appropriate community service, and/or achievement in a leadership position and the 2003-2004 ECE Outstanding Faculty Award from UPRM' s School of Engineering.
8. In May 2012, I was elected, by the consumers, to the Board of Governors of the Puerto Rico Electric Power Authority, in the first election of its kind in Puerto Rico, to represent the interests of consumers. I was President of the Board's Audit Committee and an active member of the Engineering and Infrastructure, Legal and Labor Affairs and Consumer's Affairs Committees. In 2013, Board Members elected me as Vice President of the Board, and I served in this capacity until September 2014 when my term expired

9. I have examined the Amended and Restated Power Purchase and Operation Agreement (“ECO PPOA”) between the Puerto Rico Electric Power Authority (“PREPA”) and Ecoeléctrica L.P. (“Ecoeléctrica”) and the Amended and Restated Gas Sale and Purchase Agreement (“Naturgy GSPA”) between PREPA and Naturgy Aprovevisionamientos, S.A. (“Naturgy”) and have also reviewed the current Ecoeléctrica PPOA, as amended and the Naturgy GSPA currently in effect, as well as other relevant documents.
10. The proposed Ecoeléctrica Power Purchase and Operating Agreement (“ECO PPOA”) changes every major term in the original PPOA between Ecoeléctrica and PREPA:
 - a. The proposed “amendments” materially and radically alter the relationship between Ecoeléctrica and PREPA. These are obligations of a different nature and put PREPA in an unprecedented position.
 - b. The ECO PPOA changes the expiration of the supply term from March 2022 to ten years later in September 2032.
 - c. It alters Ecoeléctrica’s contracted generation capacity from 507 MW to 530 MW.
 - d. The responsibility for fuel procurement under the proposed agreements shifts from Ecoeléctrica to PREPA, this is a significant burden for PREPA.
 - e. The commercial model on which the original PPOA is based, where the Puerto Rico Electric Power Authority (“PREPA”) made capacity and energy payments, including fuel passthrough, is modified to a capacity payment for operating expenses, capital expenditures, and “other related items”.
 - f. It is alleged that the amount of the capacity payment changes from approximately \$230 M per year at 507 MW to about \$128 M per year for 530 MW but this claim is unsubstantiated. Furthermore, the capacity payment is subject to an upward or

downward adjustment depending on the availability of the Ecoeléctrica Facility, adding greater variability and less certainty in PREPA's contractual obligations.

- g. In addition, this alleged capacity payment reduction will be, at least, partially offset by an increase in the cost of fuel in the Gas Sale and Purchase Agreement with Naturgy ("Naturgy GSPA").
- h. The current energy payment, which the contract claims as an annual average 5.6 cents/kWh is discarded and substituted by an increase in the fuel cost in the Naturgy GSPA that translates to 7.1 cents/kWh.
- i. The availability adjustment based on penalties and bonuses for low and high Ecoeléctrica availability are altered in the ECO PPOA to a higher bonus potential, such that the bonus is 0% at 93% Equivalent Availability Factor ("EAF") of Ecoeléctrica and increases a whopping 29% at 95% EAF or above.
- j. For any period in which the EAF exceeds 93%, Ecoeléctrica will obtain a bonus payment, which will be based on a percentage of the fixed capacity payment.
- k. The dispatch limits in the current PPOA range between 54 % and 76 % of dependable capacity. Under the ECO PPOA, the minimum dispatch level is based on testing and a maximum dispatch level set at 100% of dependable capacity with the possibility of dispatching above 100% pre-approved by Ecoeléctrica, thus, encouraging higher generation factors at the Ecoeléctrica plant and displacing the potential for renewables. The maximum start-ups are doubled from 50 per unit per year to 100 per unit per year. This change in the agreement fails to consider the additional air emissions related to each start-up process.

11. Similarly, the Naturgy GSPA makes significant changes.

- a. It adds twelve (12) years to the term of the current GSPA from December 2020 to September 2032.
- b. Significantly, the power plant facilities covered in the Naturgy GSPA include Costa Sur and extend to Ecoeléctrica and *potentially other power plants throughout Puerto Rico*.
- c. The current GSPA contains a pricing hedge to No. 6 fuel oil which is eliminated in the Naturgy GSPA and substituted with a price pegged to the New York Mercantile Exchange's Henry Hub natural gas futures contracts price ("HH"), with a fixed premium. The pricing formula in the Naturgy GSPA eliminates the current fuel oil hedge.
- d. The Naturgy GSPA also includes natural gas prices that are more expensive than they should be, which is shown by comparing the formula to the import price of natural gas from Trinidad to the U.S.
- e. The original fuel pricing formula was based on the *lesser* of $0.97 * (\text{No. 6 Fuel Oil Price} + \$1.29)$ or $0.97 * [50\% * (\text{No. 6 Fuel Oil Price} + \$1.125) + 50\% * (115\% \text{ HH} + \$5.95)]$, where the No. 6 Fuel Oil Price is converted from \$/BBL to \$/MMBTU by dividing by 6.03. Because the price of oil is down, the new formula, based solely on Henry Hub ("HH"), increases the price. Thus, the new contract eliminates a very useful clause.
- f. The minimum annual contract quantity under the Naturgy GSPA increases from 45 TBtu for the Costa Sur Generation Facility only to 55 TBtu adding the Ecoeléctrica fuel procurement responsibilities imposed on PREPA for both generation facilities, subject to reduction in the event of the retirement of the Costa Sur plant.

- g. The maximum annual contract quantities in the Naturgy GSPA increase from 72 TBtu to 106 TBtu, unless a reduction of the minimum annual contract quantity occurs, in which case the maximum will be 120% of the new minimum annual contract quantity.
 - h. The original and current Naturgy GSPA were entered into for fuel supply for Costa Sur. The alleged “amendments” envision cessation of fuel supply to Costa Sur in the event of closure and continuation of the agreement for fuel supply to other plants.
 - i. The Take-or-Pay (“TOP”) obligations imposed on PREPA are altered from 75% of the monthly minimum quantity and 90% of the quarterly minimum quantity, and an overall take-or-pay contract quantity in the original GSPA to 75% of the monthly *adjusted* required quantity and 90% of the quarterly *adjusted* required quantity, with no overall contract quantity in the Naturgy GSPA. Thus, adding more variability and uncertainty for PREPA.
12. The proposed agreements are inconsistent with PREPA’s Integrated Resource Plan (“IRP”).
- a. The IRP explains that ratepayers only benefit from the extension of the Ecoeléctrica PPOA, if PREPA can deliver a 60% reduction in the fixed costs. This finding is confirmed by the Siemen’s Aurora modeling. See IRP Section 1.2.
 - b. In response to PREB’s Request Of Information 10 (“ROI 10”), PREPA acknowledges that the proposed agreement fails to deliver the required savings. The current fixed capacity payment is \$230M/year; the proposed amended contract only reduces that by 44%, to \$128M/year. See the Sargent & Lundy Report, Table 2-2.
 - c. In addition, as noted above, the new Naturgy GSPA eats into even those limited and noncompliant capacity payment savings by increasing the fuel costs. *Id* at p. 10. Note, also, that the Sargent & Lundy Report only compares the new contracts with the existing agreements and fails to consider market prices for LNG which, as discussed

- below, show the magnitude of the savings that PREPA could have achieved if it had performed a competitive bidding process for the new agreements.
- d. The contract increases capacity from 507 MW to 530 MW; this increase was neither anticipated nor modeled in the IRP.

13. The proposed agreements do not favor PREPA.

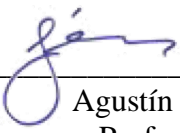
- a. The price tags are disproportionate, excessive and unreasonable. They will cost Puerto Rico ratepayers hundreds of millions of dollars in excess of market rates.
- b. Poten & Partners'¹ (“Poten”) analysis shows that the cost for U.S. liquefaction and freight to Europe, which has higher transport costs, is on the order of \$3-3.50. This compares with the \$5.60-\$5.80 adder in the new Naturgy GSPA, which is over \$2-\$2.50 higher. The new Naturgy GSPA reduces the adder by \$1, in the event of a Jones Act waiver, which would allow for U.S. LNG to be delivered to Puerto Rico. Even then, the Naturgy GSPA adder would be \$4.60-\$4.80; still \$1-\$1.50 higher than Poten’s estimate.
- c. Each extra \$1 paid in the Naturgy Adder represents about \$30 million per year (with a heat rate of approximately 7600 BTU/kWh) in additional Ecoeléctrica fuel costs, if operating at 85% capacity factor as PREPA assumes. So, for the new 10-year PPOA term, each \$1 in the adder represents \$290 million in additional payments to Naturgy.
- d. As indicated by Poten, the futures pricing indicates the adder through 2026 will be in the \$3 range. Again, this is much lower than the \$5.50 adder in the new Naturgy GSPA; even with a lower \$4.50 adder in the event of a Jones Act waiver, the difference is \$1.50, which would mean \$435 million (\$290 million x 1.5) in additional ECO PPOA fuel payments over the 10-year period of the ARAs.

¹ *Between LNG and a Hard Price Floor: Europe Sends Shut-in Signals / April 15 Webinar*, POTEN & PARTNERS <http://energy.poten.com/webinar/europe-lng-markets-april-15> (last visited April 23, 2020). __

- e. The substantial amount of investment necessary for the ARAs will affect the other options in the IRP.
- f. The opportunity cost of the excessive prices displaces the possibility of on-site solar and renewables that would help to achieve the Renewable Portfolio Standard (“RPS”), through the implementation of least cost customer-sited generation.
- g. The draft IRP prepared by Siemens Industry, Inc. for PREPA indicates that the costs of customer alternatives are lower than the final all-in Energy System Modernization (“ESM”) and S4S2 plans generation portfolio rates. The cost of customer-sited generation is significantly lower than the total rate even before the non-bypassable component is added.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my information, knowledge, and belief.

April 26, 2020



Agustín A. Irizarry Rivera Ph.D. P.E.
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