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

IN RE: REVIEW OF THE PUERTO RICO ELECTRIC POWER AUTHORITY INTEGRATED RESOURCE PLAN	**CASE NO.:** NEPR-AP-2023-0004 **SUBJECT:** Modeling Scenarios Reflecting RPS and AES Coal Plant Parameters for IRP Analysis Due to Change in Law.

RESOLUTION AND ORDER

I. Introduction

On August 24, 2020, the Energy Bureau of the Puerto Rico Public Service Regulatory Board ("Energy Bureau") issued a Final Resolution and Order on Puerto Rico Electric Power Authority's ("PREPA") Integrated Resource Plan ("IRP") under Case No. CEPR-AP-2018-0001 ("Approved IRP"). The Energy Bureau approved in part the Proposed PREPA's IRP. Through the Approved IRP, the Energy Bureau accepted in part and rejected in part PREPA's IRP and ordered the adoption and implementation of the Modified Action Plan.

On July 12, 2023, the Energy Bureau initiated a new IRP process under *In re.: Review of the Puerto Rico Electric Power Authority Integrated Resource Plan,* Case No. NEPR-AP-2023-0004 to outline the island's energy strategy for the next twenty (20) years.

On October 29, 2024, the Energy Bureau directed LUMA[1] to file its full IRP proposal in compliance with Regulation 9021[2] on May 16, 2025. The Energy Bureau also directed LUMA to file interim model results associated with the IRP in November 2024 and in February 2025. The February 2025 filing requirement was subsequently extended to March 2025.

On November 22, 2024. LUMA submitted its First Interim 2025 IRP Filing ("First Interim Filing"). Included in the First Interim Filing were workpapers with PLEXOS input assumptions and PLEXOS results for four Portfolios, associated with Scenarios 1, 2, 3 and 4. On January 10, 2025, LUMA submitted its Revised First Interim 2025 IRP Filing ("Revised Interim Filing"), containing updates to the First Interim Filing.

On March 19, 2025, Puerto Rico enacted Act 1-2025, a new law which includes: i) removal of the interim targets of the 100% Renewable Portfolio Standard by 2050, and ii) an extension (to the end of 2032) for the planned shutdown of coal-burning electric power production at the AES coal-fired power plant in Guayama.

On March 27, 2025, LUMA submitted its Second Interim IRP Filing ("Second Interim Filing"). Included in the Second Interim Filing were PLEXOS results for scenarios 1 through 10, workpapers, a preliminary "flexibility" analysis, and a summary of LUMA's recommended Preliminary Preferred Resource Plan ("PPRP"). The PPRP and associated electric power system modeling did not include the effect Act 1-2025 may have on a final preferred resource plan under the IRP process.

On April 30, 2025, the Energy Bureau issued a Resolution and Order staying the requirement for LUMA to file its final IRP from May 16, 2025 to a date to be determined. Today's Resolution and Order sets that date and provides additional information concerning the content and timing of the main IRP filing, and associated requirements.

[1] LUMA Energy LLC and LUMA Energy ServCo LLC (jointly referred as, "LUMA").

[2] *Regulation on Integrated Resource Plan for the Puerto Rico Electric Power Authority,* Regulation 9021, April 24, 2018 ("Regulation 9021").

II. Discussion and Analysis

LUMA has been working towards an IRP proposal filing since the inception of this docket in July of 2023, and the commencement of the initial pre-IRP filing technical conference in August of 2023. Several major delays have occurred, beginning with LUMA's selection of a technical contractor,[3] and continuing with set-up problems associated with the proper functioning of the modeling software.[4] A third major delay has been introduced with the enactment of Act 1-2025. Puerto Rico has a compelling need to have an updated resource plan, and completion of this IRP process in accordance with the requirements of Regulation 9021[5] is necessary to ensure such an outcome.

To reflect the legislative requirements of Act 1-2025,[6] a few key input assumptions associated with the IRP modeling must be modified. Modifications are required to ensure determination of "Resource Plan" alternatives,[7] and a "Preferred Resource Plan"[8] reflecting i) Renewable Portfolio Standard ("RPS") interim targets removal, and ii) a five-year extension (from the end of 2027 to the end of 2032) of the Guayama coal plant retirement date. Additional changes to input assumptions associated with current developments – such as, but not limited to, the ongoing unavailability of the Aguirre Steam generation units,[9] and the planned contracting for temporary emergency generation[10] – will also be made by LUMA and its technical contractor at this time, as feasible.

The filing of interim modeling results by LUMA in November of 2024 and March of 2025 has illustrated the successful completion of the complex modeling process initiated by LUMA's technical contractor in 2024. However, even though modeling execution has begun, the introduction of changes to key constraints that i) affect the capacity balances in Puerto Rico with the retention of the coal plant for five more years, and ii) affect the energy balances with the removal of the RPS interim period constraints, results in a need to re-run the modeling.

During April and May of 2025, the Energy Bureau staff and LUMA and its technical contractor (Black and Veatch) staff have met (virtually) and discussed methods to consider a refinement to the overall modeling scenario construct originally approved by the Energy Bureau in March of 2024.[11] This refinement aims to ensure a comprehensive scenario analysis required

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[3] *See Motion Submitting Update on IRP Technical Consultant Contracting Process, Request for Modification of Procedural Timeline and Request for Confidential Treatment, In re: Implementation of the Puerto Rico Electric Power Authority Integrated Resource Plan and Modified Action Plan,* Case No. NEPR-MI-2020-0012, March 31, 2023.

[4] *See Motion Submitting Responses to the Fifth Set of IRP Prefiling Period Requests of Information and Request for Confidential Treatment, and Memorandum in Support of Confidentiality, Confidential Exhibit 2 'Letter from B&V',* Case No. NEPR-AP-2023-0004, September 11, 2024. Also see *Motion Requesting Confidential Technical Conference, Case* No. NEPR-AP-2023-0004, September 11, 2024 for LUMA's explanation of complexities and challenges encountered.

[5] *Regulation on Integrated Resource Plan for the Puerto Rico Electric Power Authority*, Regulation No. 9021, April 24, 2018 ("Regulation 9021").

[6] The primary requirements of Act 1-2025 affecting the IRP resource modeling are i) elimination of the interim targets for renewable energy in Puerto Rico (which were 40% by 2025 and 60% by 2040), and ii) changes to the required retirement of the Guayama coal plant, from the end of 2027 to the end of 2032, a five-year extension.

[7] Regulation 9021 defines "Resource Plan" as "…a selection of supply-, demand-side, and transmission resources that best serves PREPA's needs under a given forecast scenario."

[8] Regulation 9021 defines "Preferred Resource Plan" as "…a portfolio of resource additions selected by PREPA from amongst those evaluated in the IRP representing the best performing resource mix to be implemented in the Action Plan." Section 1.08, Definitions.

[9] *See* Resolution and Order, *In Re: Plan Prioritario para la Estabilización de la Red Eléctrica,* Case No. NEPR-MI-2024-0005, March 19, 2025.

[10] *See* Resolution and Order, *In Re: Plan Prioritario para la Estabilización de la Red Eléctrica,* Case No. NEPR-MI-2024-0005, March 19, 2025.

[11] Energy Bureau Resolution and Order, March 13, 2024, NEPR-AP-2023-0004.

to meet the needs of Regulation 9021 while simultaneously ensuring the most time-efficient process available to produce resource plan modeling results.

To ensure a revised modeling structure that captures the changes required by Act 1-2025[12] and other changes, yet re-executes modeling runs as soon as is technically feasible, the Energy Bureau sets out a revised scenario analysis structure in **Attachment A** to this Resolution and Order for LUMA, and its technical contractor, to follow. This revision retains underlying variations in input parameters to distinguish between scenarios, such as load level and resource costs, while reducing the total number of modeling runs ultimately required to inform the development of a Preferred Resource Plan.

Given ongoing uncertainties associated with the costs of alternative resource types, the Energy Bureau **EMPHASIZES** the importance of having modeling results with "candidate" Resource Plans that reflect a variation in such cost assumptions. Regulation 9021 Section (H), Resource Plan Development, contains extensive detail on the nature and type of resource plan development modeling, sensitivity analyses, hybridized alternative resource plans, and ultimately selection of a preferred resource plan. While this part of Regulation 9021 is prescriptive in many ways, it allows the IRP contractor the flexibility and discretion to use its expertise and ensure that the selection of a preferred plan meets the tests of robustness.

LUMA and the Energy Bureau technical consultants informally discussed the time requirements for new modeling runs during their April and May 2025 meetings. Based on those discussions and recognizing the complexity and time-intensity of resource modeling, the Energy Bureau sets a new date of **October 17, 2025** for LUMA to file its IRP, for the primary sections of Regulation 9021 that require resource plan development, selection of a Preferred Resource Plan, and reporting on existing and planned transmission and distribution system elements. The Energy Bureau also provides an additional five weeks, until **November 21, 2025**, for LUMA to file the portion of the Regulation 9021 requirement that calls for LUMA to test the selected Preferred Resource Plan to determine any implications the plan may have on the transmission and distribution system.[13].

Thus, LUMA is **ORDERED** to file the IRP on **October 17, 2025** and is **ORDERED** to file additional transmission system information associated with the Preferred Resource Portfolio on **November 19, 2025**.

The Energy Bureau **EXPECTS** the following Regulation 9021 requirements to be included in the filings on each of these two dates:

October 17, 2025: All portions of Regulation 9021, inclusive of analysis, results, testimony, and workpapers (in native Excel file format as applicable) with the singular exception of the requirement in Section 2.03 (J) (2) (e), "Transmission and Distribution System Analysis" which requires a documentation of the transmission and distribution system implications of the Preferred Resource Plan.

November 21, 2025: Transmission and distribution system implications of the Preferred Plan.

[12] For example, this could be modeled as a soft target using straight-line ramp starting in 2035 throughout 2050. In LUMA's Second Interim 2025 IRP Filing, LUMA says: "a 'soft' target is referred to a non-mandatory goal that the model aims to achieve, but which can be adjusted if necessary. Unlike 'hard' constraints, to which the model must strictly adhere, 'soft' targets offer flexibility in optimization." See *Revised Second Interim 2025 IRP Filing,* Case No. NEPR-2023-0004. March 27, 2025. Page 12.

[13] Regulation 9021, Section 2.03(J)(2)(e), "The IRP shall document the transmission and distribution implications of the Preferred Resource Plan, including assessing if the plan requires incremental transmission or distribution mitigation of changes.

Attachment A to this Resolution and Order contains the revised scenario structure LUMA is **ORDERED** to follow in conducting its *PLEXOS* modeling analysis. Those scenarios vary from the set of ten scenarios originally planned for modeling, as indicated in the Energy Bureau's Resolution and Order of March 13, 2024 in this case. Those original ten scenarios were supplemented with LUMA's planned "flexibility" analysis, which resulted in a material increase in the total number of modeling runs necessary to execute the scenarios.[14] The preliminary results of these modeling runs were submitted by LUMA in its interim filings in November 2024 and March 2025 in this case, as noted. To reflect the need to complete revised *PLEXOS* modeling in an efficient manner, the Energy Bureau has **APPROVED** a revised set that captures variation in critical input parameters while allowing LUMA and its technical contractor the modeling space to use their expertise to prioritize which final modeling runs are required, and which input parameters are associated with those runs.

LUMA **MUST** complete all "Core" scenario runs indicated in Attachment A and **MUST** present those results as part of the IRP filing, considering those results when determining a Preferred Resource Plan. LUMA can complete the "Supplemental" modeling runs, indicated in Attachment A, after its initial IRP filing. The Energy Bureau **EXPECTS** those supplemental modeling runs to be completed and filed roughly at the time of the November 2025 filing of the transmission and distribution system implications of the Preferred Resource Plan, or shortly thereafter.

The Energy Bureau **EMPHASIZES** that optionality in selecting certain scenario parameters is directly built into the scenario structure in **Appendix A**, providing LUMA and its technical contractor the methodological flexibility to use a portion of the additional modeling time granted in this Resolution and Order to determine which input parameters and/or "candidate" Resource Plans it chooses to analyze during its "flexibility" analysis.

The Energy Bureau will review the October 17, 2025 filing for completeness in alignment with the pertinent sections of Regulation 9021. For the sole purpose of filing the transmission system implications of the Preferred Resource Plan after the initial filing date, the requirement of Regulation 9021 Section 2.03(J)(2)(e) is conditionally **WAIVED,** with the condition being that LUMA will file the supplemental material associated with that requirement after its selection of a Preferred Resource Plan.

Be it notified and published.

Edison Avilés Deliz
Chairman

Lillian Mateo Santos
Associate Commissioner

Ferdinand A. Ramos Soegaard
Associate Commissioner

Sylvia B. Ugarte Araujo
Associate Commissioner

Antonio Torres Miranda
Associate Commissioner

[14] LUMA's March 27, 2025 filing in this Case included modeling results from 40 different PLEXOS runs.

CERTIFICATION

I certify that the majority of the members of the Puerto Rico Energy Bureau has so agreed on May 13, 2025. I also certify that on May 13, 2025 a copy of this Resolution and Order was notified by electronic mail to RegulatoryPREBOrders@lumapr.com; mvalle@gmlex.net; arivera@gmlex.net; nzayas@gmlex.net; margarita.mercado@us.dlapiper.com; Yahaira.delarosa@us.dlapiper.com; lrn@roman-negron.com; regulatory@genera-pr.com. I also certify that on May 13, 2025, I have proceeded with the filing of the Resolution and Order issued by the Puerto Rico Energy Bureau.

I sign this in San Juan, Puerto Rico, on May 13, 2025.

Sonia Seda Gaztambide
Clerk

NEGOCIADO DE ENERGÍA DE PUERTO RICO
JUNTA REGLAMENTADORA DE SERVICIO PÚBLICO

Attachment A

Revised Scenario Structure for IRP Filing Inclusive of Act 1-2025 Requirements

#	Description	Load forecast	Solar and battery capital costs	Gas plant capital costs (CCs and GTs)	Level of DBESS control	Natural gas fuel cost	Include biodiesel as selectable option?	Hard Coded Resources
	Core Scenarios							
1	Base assumptions for all variables	Base	Base	Base	Base	Base	Yes	Base
2	High load (peakier / Low LF) with base assumptions for other variables	High	Base	Base	Base	Base	Yes	Base
3	Base load with high fossil capital costs	Base	Base	High	Base	Base	Yes	Base
4	Base load with low renewable energy capital costs and high fossil capital costs	Base	Low	High	Base	Base	Yes	Base
5	Base load with high gas fuel costs	Base	Base	Base	Base	High	Yes	Base
6	Base load with high gas fuel costs and high gas capital costs	Base	Base	High	Base	High	Yes	Base
7	LUMA Flexibility 1 or hybrid	LUMA TBD						
8	LUMA Flexibility 2 or hybrid							
9	LUMA Flexibility 3 of hybrid							
10	LUMA Flexibility 4 of hybrid							
11	LUMA Flexibility 5 or hybrid							
12	Biodiesel is unavailable/too costly on island	Base	Base	Base	Base	Base	No	Base
	Supplemental Scenarios							

#	Description	Load forecast	Solar and battery capital costs	Gas plant capital costs (CCs and GTs)	Level of DBESS control	Natural gas fuel cost	Include biodiesel as selectable option?	Hard Coded Resources
13	High DBESS control with base assumptions for other variables	Base	Base	Base	High	Base	Yes	Base
14	No NGCC 460 MW San Juan	Base	Base	Base	Base	Base	Yes	No NGCC
15	Marine Cable	Base	Base	Base	Base	Base	Yes	Base
16	Alternative RPS 1	Base	Base	Base	Base	Base	Yes	Base
17	Alternative RPS 2	Base	Base	Base	Base	Base	Yes	Base

Scenarios assumptions:
Constant trajectory of distributed PV (DPV) installations for all scenarios.
Identical trajectory of fuel oil costs for each heavy fuel oil and light fuel oil (diesel) for all scenarios.
Identical trajectory of hard coded resources (MW and type and year of install) for all scenarios except #14 as noted.
RPS soft target beginning 2035 for all scenarios except #16 and #17 (ramp to 2050).
Alternative RPS1 = RPS soft target beginning 2025 (ramp to 2050).
Alternative RPS2 = no RPS soft target at all until very late in the planning horizon (2040-2044, ramp to 2050).
All scenarios will use a separate resource option to reflect ASAP Phase 2 BESS at a lower cost than BESS low-cost assumption.
All scenarios assume Aguirre ST 1&2 are out of service, and 800 MW of temporary generation is in service, starting in 2025.
DBESS = Distributed Battery Energy Storage Systems
Solar PV and BESS costs are separate variables in the modeling: "base" and "low" capital costs seen here apply to each.