### GOVERNMENT OF 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:** Third Set of Requests of Information ("ROI") during the 2024 IRP - Prefiling Process (Phase 1).

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# **RESOLUTION AND ORDER**

On August 8, 2023, the Energy Bureau of the Public Service Regulatory Board ("Energy Bureau") held an initiating technical conference for the 2024 Integrated Resource Plan ("2024 IRP"). The technical conference included a presentation by LUMA<sup>1</sup> on some of the agenda items concerning the technical aspects of the IRP ("August 8 Presentation"). LUMA filed those materials. Presentation and discussion of other technical items from the agenda were postponed pending the availability of LUMA's selected technical contractor.

On October 31, 2023, the Energy Bureau held its second technical conference in the pre-filing phase of the 2024 IRP. LUMA, along with its selected technical contractor Black and Veatch, presented a slide deck with materials covering the items on the agenda. During the October 31 technical conference, the Energy Bureau requested additional information from LUMA. Some of the information requested was to be filed shortly after the conference, and other information was to be filed before the next technical conference. The requested materials included: i) corrections to identified inaccuracies on a few slides; ii) formal filings to ask for an extension to file the 2024 IRP in June instead of March 2024, and to request flexibility in how quantitative weights may be needed if a scorecard is included in the IRP filing; iii) resiliency value forecasts and the associated computations steps for any resiliency value attributed to resources as part of the IRP; and iv) updated information about the electric vehicle forecast for certain municipalities.

On January 30, 2024, the Energy Bureau held its third and now final technical conference for this 2024 IRP pre-filing period, with a focus on certain transmission issues, especially how interconnection of new resources would be addressed in the 2024 IRP. LUMA presented information on various transmission and other issues during the technical conference. A discussion on potential waivers from Regulation 9021<sup>2</sup> was discussed at the conference. The presentation from LUMA included a depiction of planned scenarios for IRP modeling.

On March 11, 2024, LUMA filed a *Motion Submitting Revised 2024 Integrated Resource Plan Scenarios and Characteristics* ("March 11 Motion"), including an "Exhibit 1 LUMA 2024 IRP Revised Scenarios and Characteristics" with Tables 2 and 3 listing the Revised Scenarios and Characteristics to be modeled, including those associated with "Core" scenarios and those associated with "Supplemental" scenarios.

On March 13, 2024, the Energy Bureau issued a Resolution and Order confirming the scenarios for analysis, indicating a potential for the Energy Bureau to direct analysis of further scenarios beyond those included in the March 11 Motion, and setting a date of on or before August 1, 2024 for LUMA to file the Supplemental scenarios analysis.

The Energy Bureau had indicated, during earlier 2024 IRP prefiling phase technical conferences, a potential for a fourth prefiling phase technical conference to address certain distribution-system related issues in Regulation 9021. LUMA's responses to existing Requests of Information ("ROIs") and the Energy Bureau's expectations of further responses





<sup>&</sup>lt;sup>1</sup> LUMA Energy LLC and LUMA Energy ServCo LLC ("jointly referred as, "LUMA").

<sup>&</sup>lt;sup>2</sup> Regulation on Integrated Resource Plan for the Puerto Rico Electric Power Authority, April ("Regulation 9021").

to follow-on questions in a third set of ROIs attached to this Resolution and Order is sufficient to prepare for the forthcoming 2024 IRP filing and hearings.

The Energy Bureau has **DETERMINED** that a fourth technical conference is not warranted. The Energy Bureau **REMINDS** LUMA that distribution information required under Regulation 9021 is to be included in its 2024 IRP filing due on June 28, 2024.

The Energy Bureau **REMINDS** LUMA of the importance of including the information required under Regulation 9021 in its June 28, 2024 filing and **EMPHASIZES** the importance of LUMA including all analytical workpapers,<sup>3</sup> in their original format (e.g., Excel files with formulae intact) and all written direct testimony<sup>4</sup> according to the specifics of Regulation 9021. The Energy Bureau **REMINDS** LUMA that a completeness determination<sup>5</sup> of the 2024 IRP filing depends on provision of comprehensive analytical support for its required structure.<sup>6</sup>

A Third Set of 2024 IRP pre-filing period ROIs are included as **Attachment A** to this Resolution and Order. LUMA is **ORDERED** to respond to these ROIs **by no later than June 7, 2024**.

Be it notified and published.

Lillian Mateo Santos

Associate Commissioner

Sylvia B. Ugarte Araujo Associate Commissioner

Antonio Torres Miranda

Associate Commissioner

#### CERTIFICATION

I certify that the majority of the members of the Puerto Rico Energy Bureau agreed on May 17, 2024. Chairman Edison Avilés Deliz and Associate Commissioner Ferdinand A. Ramos Soegaard did not intervene. Also certify that on May 17, 2024, I have proceeded with the filing of this Resolution and Order and was notified by email to mvalle@gmlex.net; arivera@gmlex.net; margarita.mercado@us.dlapiper.com; brannen@genera-services.com; kbolanos@genera-pr.com; regulatory@genera-pr.com.

I sign in San Juan, Puerto Rico, today, May 17, 2024.

Sonia Seda Gaztambide Clerk

<sup>3</sup> Regulation 9021, Section 1.08 B) 41); Section 2.02 F); Section 3.06 A).



<sup>&</sup>lt;sup>4</sup> Regulation 9021, Section 3.06.

<sup>&</sup>lt;sup>5</sup> Regulation 9021, Section 3.02 A) 1).

<sup>&</sup>lt;sup>6</sup> Regulation 9021, Section 2.02.

## Attachment A

#### Third Set of IRP prefiling period Requests of Information to LUMA

- 1. Reference: RA report December 2023, Appendix 5. Model Inputs Generation Fleet, and legacy units used in PLEXOS modeling
  - a. Re: Table A-3: Summary of Expected Operating Thermal Generators, FY2024. Confirm or explain otherwise if this table represents the list of legacy units, with associated "available capacity", for use in the PLEXOS modeling.
  - b. Explain how forced and planned outages for legacy units are to be modeled in PLEXOS.
  - c. In Excel file format, provide the list of legacy units used in the PLEXOS modeling, with the following attributes as represented in PLEXOS, for all years of the planning horizon inclusive of changes to any of these parameters over the planning horizon:
    - i. Available Maximum Capacity and representation in model
    - ii. Forced outage rate and representation in model
    - iii. Planned outage rate and representation in model
    - iv. Primary fuel
    - v. Secondary fuel, if applicable if dual fuel.
    - vi. Variable operating costs in \$/MWh
    - vii. Fixed operating costs in \$/kW-year
    - viii. Heat rate curve, by capacity segment, as applicable / as modeled
    - ix. Trajectory of fuel costs by unit, noting if there are any differences from the fuel cost trajectory already provided in response to 2<sup>nd</sup> ROI question 10, "cost trajectory of fuels" attachment.
    - x. Emission rates by unit as represented in the modeling.
    - xi. Starting and stopping parameters, minimum operating levels, minimum run time and minimum down times, and related parameters as applicable, by unit.
- 2. RA report December 2023, Appendix 5. Model Inputs Generation Fleet and Table A-4: Summary of Operating Renewable Generators
  - a. Confirm or explain otherwise that the units in Table A-4 will be represented in PLEXOS.
- 3. As necessary update the information provided in slides 30-34 of the 10/31/2023 presentation from the technical conference. List the generation resources currently planned or contracted for deployment that will be used in PLEXOS, for the following categories. Indicate the MW size, energy duration (for battery resources), the modeled Puerto Rico deployment date (year, or month and year), estimated average annual capacity factor, and any other relevant information for use in PLEXOS that will impact the results of the long-term expansion plan outcomes:
  - a. Tranche 1 Solar PV resources
  - b. Tranche 1 Battery Energy Storage Resources
  - c. Tranche 1 Virtual Power Plan resources
  - d. Tranche 2 Solar PV resources
  - e. Tranche 2 Battery Energy Storage Resources
  - f. Emergency generation and black start generation, RICE, and CT units, under procurement by Genera using FEMA funding.
  - g. Additional Battery Energy Storage Resources proposed by Genera using FEMA funding, up to 430 MW of 4-hour duration units.



- h. Additional Battery Energy Storage Resources proposed by LUMA as "accelerated storage addition program" (ASAP).
- 4. RA report December 2023, P. 12, concerning the 350 MW of FEMA emergency generation: "... 350 MW of highly available generation reduces the risk [of generation shortfalls] substantially. There is currently uncertainty over the duration of this generation and therefore it was not included as part of the Base Case assumptions."
  - a. Confirm, or explain otherwise, that the 350 MW of "FEMA" emergency generation will be included as a firm resource in the PLEXOS modeling for the 2024 IRP.
  - b. The total nameplate capacity associated with the total number of units of "FEMA" generation is greater than 350 MW. PREPA's Motion indicates that 7 units totaling 219 MW is in place at Palo Seco, for a firm capacity of 150 MW; and 10 units totaling 310 MW is in place at San Juan, for a firm capacity of 200 MW.<sup>7</sup> Confirm, or explain otherwise, that the effective or firm capacity contribution as will be modeled in PLEXOS for the units at these locations is 350 MW, with no further reduction in availability or rating due to forced or planned outage.
- 5. RA report December 2023, P. 15: "LUMA is also optimistic that improvements planned by Genera to the PREPA-owned thermal generation facilities will improve overall reliability in the future".
  - a. How is LUMA representing this optimism concerning the availability or reliability of the Genera-operated legacy units in the PLEXOS modeling?
  - b. Confirm or explain otherwise that any specific changes to outage rates and the year in which such changes are considered are included in response to question 1.c) ii) and iii) above, as applicable. If not applicable, explain how the modeling accounts for the possible improvements.
- 6. Reference: RA report December 2023, Table A-2, P. 50-51. This table contains "target risk measure" metrics considered for other jurisdictions. For Hawaii and Guam, a LOLE standard of 1 day per 4.5 years is used; for the Virgin Islands, a LOLE target of 1 day in ten years is planned for 2044, but the current target is 1 day per year (in 2020). Page 39, Section 3.2, lists "Sensitivity Analyses" with various aims, including "Meeting Industry LOLE Benchmarks".

Reference: Response to 2nd ROI, Question 1 b), re: parameters for LOLE metric acceptable to the model: "The targeted LOLE criterion for the 2024 IRP will be less than or equal to 1 day of loss of load in 10 years. However, due to the current RA shortfall, LUMA does not yet know if the LOLE target is reasonably achievable in the early years of the 2025 to 2044 IRP. The LOLE target is an input into the long-term expansion planning model of PLEXOS (the Long-Term model), which determines an expansion plan that is then run through the short-term production costing model in PLEXOS...."

- a. Provide the specific LOLE parameters that will be used as inputs to the Long-Term PLEXOS model. How will they vary for "the early years" of the 2025-2044 period? Provide this information by year for all years of the planning horizon.
- b. If such targets are to be relaxed in the early years of the modeling, explain how this is being implemented.
- c. On what basis is LUMA using a one-day-in-ten years LOLE standard, DE EA considering that other island jurisdictions use less stringent standards or (such as the Virgin Islands) seek to ramp up over a time to a more stringent LOLE level?

<sup>&</sup>lt;sup>7</sup> In re: Luma's Response to Hurricane Fiona, Case No.: NEPR-MI-2022-0003, Urgent Motion in Compliance with resolution and Order, filed by PREPA on March 5, 2024, https://energia.pr.gov/WpE R T content/uploads/sites/7/2024/03/20240305-MI20220003-Urgent-Motion-in-Compliance-with-Resolution-and-Order.pdf (las visit, May 17, 2024).

- 7. In response to the 2<sup>nd</sup> set of ROIs, question No. 11 a), LUMA provided an Excel file attachment ("Attachment 1") with data described as "Core Load and Load Modifiers all shown as Impact to System Generation". These data appear to align with "base" load forecast information.
  - a. Please confirm, or explain otherwise, that the core load and load modifier data in the noted Attachment 1 file are associated with "base" Load Growth trajectory [as listed in LUMA's Exhibit 1, LUMA 2024 IRP, Revised Scenarios and Characteristics, Table 2, and Table 3, from LUMA's *Motion Submitting Revised 2024 Integrated Resource Plan Scenarios and Characteristics*, dated March 11, 2024].
  - b. Provide, in Excel file format, the equivalent core load and load modifier data for the "high" (Scenarios 2 and 4) and "low" (Scenarios 5 and 8) Load Growth trajectories listed in Tables 2 and 3 of the aforementioned Exhibit 1.
- 8. In response to the 2<sup>nd</sup> set of ROIs, question No. 10, LUMA provided a series of Excel file attachments, including: an "Attachment 4" Excel file (labeled in the response as "Attachment 2", pertaining to the Cost trajectory of UBESS and DBESS, and associated with 1<sup>st</sup> ROI question No. 6 items e, f, g, & h, slide 13); and an "Attachment 2" (labeled in the response as "Attachment 1", pertaining to the Cost trajectory of Onshore Offshore Wind & UPV-DPV (utility PV and distributed PV) and associated with 1<sup>st</sup> ROI question No. 6 items a, b, c and d, slides 12-15). These cost data in both Excel files appear to align with "base" cost information.
  - a. Please confirm, or explain otherwise, that the data in the two referenced Excel attachment files are associated with "base" trajectories for DER Growth/PV/BESS, PV Cost, Storage Cost, and Resource Capital Cost fields [as listed in LUMA's Exhibit 1, LUMA 2024 IRP, Revised Scenarios and Characteristics, Table 2, and Table 3, from LUMA's *Motion Submitting Revised 2024 Integrated Resource Plan Scenarios and Characteristics*, dated March 11, 2024].
  - b. Provide, in Excel file format, the equivalent information for the "high" (Scenarios 2 and 4) and "low" (Scenarios 5 and 8) trajectories for DER Growth/PV/BESS, PV Cost, Storage Cost, and Resource Capital Cost fields listed in the Tables 2 and 3 of the aforementioned Exhibit 1.
- 9. For all incremental distributed solar PV ("DPV") annual MW and GWh quantities included in the "Attachment 1" load modifiers file in response to 2<sup>nd</sup> ROI No. 11 a),
  - a. Provide in Excel file format the 8,760 hourly shape of the DPV resource. If required, provide any further information necessary to explain how the hourly output shape of the DPV resource is modeled as a load modifier in PLEXOS.
  - b. Provide an explanation of the how LUMA and B&V modeled the "shape" of the "28.5% rebound effect load" and provide all source information documenting the use of a 28.5% magnitude effect and how it is appropriate to use for Puerto Rico.
- 10. In response to the 2<sup>nd</sup> set of ROIs, question No. 6, LUMA references the PR100 report noting that the average levelized cost of energy ("LCOE") for solar resources under "More Land" is less than the LCOE for "Less Land".
  - a. Explain how LUMA will interpret this average differential cost for solar PV associated with More or Less land when structuring the solar PV supply costs. In particular, will LUMA and B&V segment the supply curve cost for utility scale solar, assuming that all "first selected" utility scale solar will have lower costs, and a second tranche of higher cost utility scale solar PV will be in place for "Less Land" scenarios?

