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:** LUMA Motion Requesting Continuance of 2024 IRP Filing Deadline and 4th Requests of Information (ROI)

RESOLUTION AND ORDER

I. Introduction

On June 7, 2024, LUMA filed a *Motion Requesting the Continuance of the Deadline for the 2024 IRP Filing*, ("June 7 IRP Motion"). The June 7 IRP Motion requests a continuance of the June 28, 2024 filing deadline for the 2024 IRP due to modeling delays associated with its base case scenario. LUMA "anticipates having a base case scenario in the upcoming days" and states it will "be able to provide an updated schedule of the 2024 Filing no later than June 28, 2024, provided the base case resource plan has been completed".[1]

The June 7 IRP Motion has a 9-page Exhibit 1 which summarizes "Unforeseen Modeling Changes" and "Steps Taken to Resolve the Modeling Software Issues".[2] Exhibit 1 also includes an attached 7-page letter from Black and Veatch with additional technical explanation of the issues causing the modeling delay.

Black and Veatch states:[3]

> "the largest cause of delay involves certain issues related to the computer model utilized that have been problematic in this modeling assignment. Foremost is the methodology the planning model uses to determine the loss of load probability (LOLP) calculation in the expansion planning module. The desire was to use the LOLP to track progress toward the 0.1 day per year reliability target and to avoid using a reserve margin criterion.
>
> ...
>
> After much study and discussion with the software vendor, it was realized/acknowledged that the LOLP target input is used in the model as a proxy to estimate reserve margin criteria in the determining the amount of capacity that needs to be added to the system based on the installed capacity of the generator to meet the system reliability criteria".

The Black and Veatch letter continues, describing further issues associated with "Differences Between the Build Retire Module and Production Cost Module Results", "Data Inputs to the Model", "Testing the Production Heat Rate Error Method", and the "Complexity of Puerto Rico's Model". The issues are mostly focused on thermal fossil unit representation in the model, model run time concerns, using eight transmission planning areas rather than a single area, and complexity associated with multiple planning objectives.

On June 7, 2024, LUMA also filed a *Motion Submitting Responses to the Third Set of IRP Prefiling Period Requests of Information and Request for Confidential Treatment* ("June 7 ROI

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[1] LUMA, June 7 IRP Motion, page 8, ¶ 26.

[2] LUMA, June 7 IRP Motion, Exhibit 1, pages 6-7. LUMA further states on page 8 of Exhibit 1 that "LUMA and the IRP Technical Consultants are currently in the final phases of development and validation of the resource plan resulting from the base case scenario and expect to complete this task in the coming weeks".

[3] June 7 IRP Motion, Black and Veatch letter attachment to LUMA's Exhibit 1, at page 1.

Motion"). LUMA provided, as Exhibit 1 to the June 7 ROI Motion, responses to the Energy Bureau's[4] Third Set of IRP prefiling period ROIs from May 17, 2024.

II. Discussion

The technical consultant contract was initially approved by the Energy Bureau in October of 2022, and at that time it was known that the PLEXOS modeling tool would be used for scenario simulation in the 2024 IRP.[5] In December of 2023, LUMA finalized its Resource Adequacy report for the period July 1, 2023 through June 30, 2024, in which it extensively addressed stochastic considerations in examining Resource Adequacy.[6] In an April 1, 2024 response to question No. 1 of the Energy Bureau's March 11, 2024 Second Request of Information (ROI)[7], LUMA described how it was planning to address a probabilistic approach to Resource Adequacy.

LUMA's statement in the June 7 IRP Motion that "the difficulties encountered were not foreseeable"[8] rings hollow, since LUMA and the technical contractor had been considering the use of PLEXOS and planning to address Resource Adequacy in a stochastic way. The Energy Bureau has **DETERMINED** that the technical considerations and issues explained in Exhibit 1 of the June 7 IRP Motion and included in the attached Black and Veatch letter are fundamental issues associated with all industry-used capacity expansion and production cost integrated resource planning models and are not unusual as challenges to be anticipated in IRP modeling. The Energy Bureau is dismayed that LUMA has identified this issue with less than 3 weeks remaining to the planned filing date of June 28, 2024.

LUMA has indicated that it has resolved the modeling issues and is refining the base case runs.[9] It indicated that it had hoped to have a fully resolved base case by early June, to meet the June 28, 2024 filing deadline.[10] The Energy Bureau **DETERMINES** it is reasonable to provide sufficient additional time to LUMA and its technical contractor to finish the IRP filing.

The Energy Bureau thus **GRANTS** LUMA's request to suspend the filing date of June 28, 2024, to a date further in time. The Energy Bureau **ORDERS** LUMA to file by no later than June 28, 2024, and earlier, if possible, an expected date on which the IRP will be filed with all completed sections and workpapers. The Energy Bureau further **GRANTS** to LUMA permission to file the Supplemental scenarios, originally to be filed by August 1, 2024, no later than five weeks after the filing of the core scenarios.

The Energy Bureau **REMINDS** LUMA of the critical importance of providing all workpapers associated with the IRP modeling in its eventual filing. Given the technical issues noted by LUMA in its Exhibit 1 to the June 7 IRP Motion, the workpapers must provide the full set of input parameters used in the PLEXOS capacity expansion planning module (the "LT Plan" module) for all filed scenarios.[11] In addition to these workpapers, LUMA must also provide an initial response to question No. 1 of the Fourth Set of ROIs included as Attachment A to

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[4] Energy Bureau of the Puerto Rico Public Service Regulatory Board ("Energy Burau").

[5] Resolution and Order in NEPR-MI-2020-0012, October 14, 2022, at page 3.

[6] LUMA, NEPR-AP-2023-0004, Exhibit 1 to Motion Submitting Final Version of Resource Adequacy Analysis Report as a Supplement to Response to Request for Information Number 1, "Puerto Rico Electrical System Resource Adequacy Analysis", December 11, 2023, e.g. at pages 17-24, and pages 31-38.

[7] LUMA response to question No. 1, second set of IRP Prefiling period ROIs.

[8] June 7 IRP Motion, page 2.

[9] June 7 IRP Motion, paragraph 23, page 7; paragraph 26, page 8; Exhibit 1 to June 7 IRP Motion, page 8.

[10] June 7 IRP Motion, paragraph 23, page 7.

[11] The PLEXOS capacity expansion module is known as the "LT [long term] Plan" module. Available at: https://portal.energyexemplar.com/unified-help/plexos-desktop/Main.LTPlan.html (last visit June 17, 2024).

this Resolution and Order. Question No. 1 requests clarifying details pertaining to some of the issues identified by LUMA and Black and Veatch concerning the base case modeling issues.

Some responses to the Third Set of ROIs are incomplete or require clarification. Responses to Question No. 3 and Question No. 9 require more information, and the response to Question No. 6 requires clarifying information. The Energy Bureau **ORDERS** LUMA to respond to a fourth set of ROIs in Attachment A to this Resolution and Order to address this. LUMA is to respond to these ROIs by July 5, 2024.

Be notified and published.

Edison Avilés Deliz
Chairman

Ferdinand A. Ramos Soegaard
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 June 18, 2024. Associate Commissioner Lillian Mateo Santos did not intervene. Also certify that on June 18, 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; Yahaira.delarosa@us.dlapiper.com; lrn@roman-negron.com; regulatory@genera-pr.com.

I sign this in San Juan, Puerto Rico, today, June 18, 2024.

Sonia Seda Gaztambide
Clerk

ATTACHMENT A

Fourth Requests of Information (ROIs) to LUMA – 2024 IRP

1. Re: Black and Veatch letter, pages 1-2, expansion planning module, "understanding the details behind the calculation of LOLP in the model allowed us to make appropriate adjustments so that consistent results are now being seen between the capacity expansion module and the production cost module of the software" for base case scenario.
    a. What specific adjustments, to which parameters, were made to obtain consistent results between the modules?
    b. As applicable, describe in full which PLEXOS LT Plan Chronology method was used - partial, fitted or sampled - and the reasons for its use.
    c. Provide all input parameters used for the LT Plan or expansion planning module configuration for the base case scenario including all LT Plan Chronology details.
    d. At the time of the full core scenarios filing, include the top 20 "suboptimal solutions"[12] available from the model for the base case scenarios.
2. Re: Responses to Third ROI Question No. 3. Question No. 3 requested modeled Puerto Rico deployment dates for all resources. The response did not provide modeled deployment dates for resources other than Tranche 1 PV and battery storage resources and phase 1 of the ASAP battery resources.
    a. Provide modeled deployment dates, even if estimated, for all Tranche 2 resources listed in Table 4 of the response to 3rd ROI No. 3.
    b. Provide modeled deployment dates, even if estimated, for all RICE and CT Units proposed by Genera, listed in Table 5 of the response to 3rd ROI No. 3.
    c. Provide modeled deployment dates, even if estimated, for all BESS resources proposed by Genera, listed in Table 6 of the response to 3rd ROI No. 3.
    d. Explain why LUMA plans to include only the first phase of the ASAP batteries (in Table 7 of the response to 3rd ROI No. 3.) as a fixed decision.
    e. Confirm or explain otherwise that the modeled deployment date of the first phase of ASAP batteries is in CY2025, and state which month of CY2025 the deployment will be modeled in PLEXOS.
3. Re: response to 3rd ROI Question No. 9b, concerning the proposed use of a 28.5% rebound effect load for small solar PV installations.
    a. Provide the two studies listed in response to 9b.
    b. Explain how the proposed 28.5% rebound effect "based on empirical studies and analyses relevant to Puerto Rico" is actually relevant to Puerto Rico and provide any Puerto Rico specific evidence in support of that assertion.
4. Re: response to Question No. 6.
    a. In response to Question 6a and 6b, LUMA states that it will not use an LOLP target until 2030 and states that 2030 is the earliest date that new capacity could be added to the model.
        i. Confirm or explain otherwise that the model will thus utilize only existing or "fixed decision" resources such as those listed in the response to Question 3 of the Third Set of ROIs for all simulation runs for the years 2025 through 2029.
        ii. Confirm or explain otherwise that the model will allow new resources to be available at the beginning of the 2030 year and thus present if economically built by the model in simulations for the year 2030.

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[12] See PLEXOS LT Plan Solution Count page, "Solution Count is the maximum number of solutions produced in the Solution Hierarchy. By default, LT Plan will only compute the global optimal solution in terms of the expansion and production decisions. Setting this value to a number greater than one causes the simulator to continue finding combinations of the expansion decisions, and resulting production outcome, in order from optimal to second-to-optimal, third-to-optimal etc.... "Available at https://portal.energyexemplar.com/unified-help/plexos-desktop/LTPlan.SolutionCount.html (last visit, June 13, 2024).

b. On what basis does LUMA assume that "2030 was the earliest new capacity that could be added in the 2024 IRP", as stated page 20 in response to 6b?
c. Please explain fully how LUMA considers all relevant factors that may lead to delays in the operation of new capacity or energy resources in Puerto Rico.
d. Provide any additional information necessary to understand how LUMA and Black and Veatch determined the earliest year of deployment allowed in the model.