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**: Motion Submitting Responses to the First Set of 2025 IRP Post Filing Request of Information in Compliance with Resolution and Order of December 3, 2025

MOTION SUBMITTING RESPONSES TO THE FIRST SET OF 2025 IRP POST FILING REQUEST OF INFORMATION IN COMPLIANCE WITH RESOLUTION AND ORDER OF DECEMBER 3, 2025

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

COME NOW LUMA Energy, LLC ("ManagementCo"), and **LUMA Energy ServCo, LLC** ("ServCo"), (jointly referred to as "LUMA"), and respectfully state and request the following:

1. On October 17, 2025, LUMA filed a *Motion Submitting 2025 IRP and Request for Confidential Treatment*. Therein, LUMA submitted the 2025 IRP recommending that the Puerto Rico Energy Bureau ("Energy Bureau") approve Resource Plan Hybrid A as LUMA's Preferred Resource Plan (PRP). Resource Plan Hybrid A represents a balanced, cost-effective path to meeting Puerto Rico's energy needs, reflecting current expectations for fuel and technology costs. In compliance with the May 13th Order, LUMA filed the 2025 IRP Report, along with the workpapers and models relied on in developing it.

2. On October 29, 2025, LUMA filed a *Memorandum of Law in Support of Request for Confidential Treatment of Revised 2025 IRP and Submission of Public Version and Confidential Version of Revised 2025 IRP*. LUMA submitted a revised, redacted version of the 2025 IRP Report, along with the workpapers and models relied on in developing the 2025 IRP

Report, for public disclosure.[1] Moreover, pursuant to this Energy Bureau's Policy on Confidential Information, LUMA filed the corresponding memorandum of law stating the legal basis for the request to treat certain portions of the revised version of the 2025 IRP and the workpapers and models relied on in developing the 2025 IRP confidentially.

3. Thereafter, on November 21, 2025, LUMA filed a *Motion Submitting the Transmission Needs Studies Report, Request for Confidential Treatment, and Memorandum in Support of Confidentiality*. LUMA submitted the Transmission Needs Studies Report in compliance with the portion of Regulation 9021 that requires LUMA to test the Preferred Resource Plan to determine any implications it may have on the transmission and distribution system. It also filed a revised version of the pre-filed direct testimony of Dr. Ajit Kulkarni, Grid Modernization Manager, in support of the Transmission Needs Studies Report.

4. On December 3, 2025, the Energy Bureau issued a Resolution and Order directing LUMA to respond to the *First Set of 2025 IRP Post Filing Request For Information* within fifteen (15) business days of the notice of the Resolution and Order ("December 3rd Order"). The *First Set of 2025 IRP Post Filing Request For Information* addresses 2025 IRP completeness, including the need for LUMA to provide further clarity on some aspects of the 2025 IRP Report and to provide further explanation and workpapers in support of the material filed.

5. LUMA hereby submits narrative responses to all questions on this set, except for those requiring the data referenced in question four of the *First Set of 2025 IRP Post Filing Request For Information*. Significant time and resources are required to extract the data from PLEXOS®,

[1] The revised version differed from the version filed on October 17, 2025, in that it addressed some grammatical errors and formatting issues, and revised the data presented in Tables 66, 67, and 68, specifically the values in the second column labeled "PR100 Cost Scaling Factor." It also revisited some of the confidential designations originally made.

referenced in question four, spanning a 20-year period across all Scenarios and iterations, and at the hourly level.

6. LUMA requests an extension to submit no later than January 15, 2026, the hourly data requested in question four of the *First Set of 2025 IRP Post Filing Request For Information*, along with detailed responses to questions 4b, 4c, 4d, and 8d, which are directly related to that data. The decision to divide the responses stems from the significant time and resources required to extract the requested hourly data from PLEXOS®, spanning 20 years across scenarios, iterations, and the hourly level.

7. In compliance with the December 3rd Order, LUMA hereby submits as *Exhibit 1* the information responsive to the requests for information addressing the 2025 IRP completeness. It requests an extension to submit the hourly data of all Scenarios along with detailed responses to questions 4b, 4c, 4d, and 8d, which are directly related to that data, no later than January 15, 2026. LUMA may further refine its response to other questions based on the detailed hourly data extracted.

WHEREFORE, LUMA respectfully requests that the Energy Bureau **take notice** of the aforementioned, accept the narrative responses to the *First Set of 2025 IRP Post Filing Request For Information*, in compliance with the December 3rd Order, and grant an extension allowing LUMA to submit, no later than January 15, 2026, the hourly data requested in question four of the *First Set of 2025 IRP Post Filing Request For Information*, along with detailed responses to questions 4b, 4c, 4d, and 8d, which are directly dependent on that data.

WE HEREBY CERTIFY that this Motion was filed using the electronic filing system of this Energy Bureau and that electronic copies of this Motion will be notified to the Puerto Rico Electric Power Authority: lionel.santa@prepa.pr.gov and through its attorneys of record Mirelis

Valle-Cancel, mvalle@gmlex.net; and Alexis G. Rivera Medina, arivera@gmlex.net; and Genera PR, LLC, through its attorney of record Luis R. Román Negrón, lrn@roman-negrom.com.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, on December 22, 2025.

DLA Piper (Puerto Rico) LLC
Calle de la Tanca #500, Suite 401
San Juan, PR 00901-1969
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/s/ Yahaira De la Rosa Algarín
Yahaira De la Rosa Algarín
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Exhibit 1

2025 Integrated Resource Plan

(2025 IRP)

Attachment A Responses to First Set of 2025 IRP Post-filing Request For Information (RFI)

NEPR-AP-2023-0004

LUMA

Executive Summary

This response by LUMA addresses inquiries from the Puerto Rico Energy Bureau (Energy Bureau) related to the First Set of 2025 IRP Post Filing Request for Information (1st Set of 2025 IRP Post filing RFI), regarding the completeness of the 2025 IRP.

LUMA remains committed to supporting and advancing the transformation of Puerto Rico's energy system into one that is more resilient, cleaner, and sustainable for all customers. As the operator of the transmission and distribution system, LUMA is responsible for developing an Integrated Resource Plan (IRP) that outlines the transformation of the island's energy resources over the next two decades. LUMA's 2025 Integrated Resource Plan (2025 IRP) is designed to meet customer energy needs while aligning with Puerto Rico's public energy policies— including eliminating coal by 2032 and achieving 100% renewable energy by 2050— in a reliable and responsible manner that serves the long-term interests of Puerto Rico.

LUMA's energy planning approach incorporates a wide range of considerations, including resource constraints, land use, cost dynamics, and the integration of emerging technologies.

LUMA values the opportunity to collaborate closely with the Energy Bureau and its consultants to develop a practical and actionable plan that supports Puerto Rico's long-term energy goals. The shared goal is to shape a 2025 IRP grounded in analytical rigor and reflect a diverse range of realistic future scenarios and resource portfolios, ultimately guiding Puerto Rico toward a sustainable, reliable, and customer-focused energy future aligned with public policy priorities.

2025 INTEGRATED RESOURCE PLAN

Attachment A
NEPR-AP-2023-0004

RESPONSE: RFI-LUMA-AP-2023.0004-20251203-PREB

INTRODUCTION

On December 3, 2025, the Energy Bureau issued a Resolution and Order (December 3, R&O), including the 1st Set of 2025 IRP Post filing RFI, ordering LUMA to submit responses to a total of eight (8) questions within fifteen (15) business days, by December 26, 2025.

This filing focuses on questions 1 through 8 of the 1st Set of 2025 IRP Post filing RFI addressing questions related to the Completeness of the 2025 IRP on the following items: 1) Battery Energy Storage System (BESS) Cost Estimates; 2) Fuel Price Forecasts; 3) Consolidated Workpapers; 4) Outage and Loss of Load Expectation (LOLE) Modeling; 5) Planned and Forced Outage Rates Modeling; 6)Forced Outages Rates; 7) Resource Plan Hybrid A; and 8) Battery ST.

LUMA hereby submits narrative responses to all questions in this 1st Set of 2025 IRP Post filing RFI, except those that require the hourly data referenced in question 4.

Significant time and resources are required to extract the data referenced in question 4 regarding PLEXOS®, which spans a 20-year period across scenarios, iterations, and at the hourly level. Therefore, LUMA is requesting an extension until January 15, 2026, to submit detailed responses to questions 4b, 4c, 4d, and 8d, which are directly related to that data. LUMA may further refine its response to other questions based on the detailed data extracted.

List of Responses and Attachments

Response ID	Document Type	Response Subject
RFI-LUMA-AP-2023.0004-20251203-PREB-003A	Excel document	Consolidated Workpapers List Explanation
RFI-LUMA-AP-2023.0004-20251203-PREB-005B	Excel document	Thermal Units Age

List of Acronyms

ACRONYM	DEFINITION
AEO	Annual Energy Outlook
ASAP	Accelerated Storage Addition Program
ATB	Advanced Technology Baseline
BESS	Battery Energy Storage System
BTU	British Thermal Unit
DBESS	Distributed Battery Energy Storage System
DPV	Distributed Solar Photovoltaic
EUE	Expected Unserved Energy
FOR	Forced Outage Rate
IRP	Integrated Resource Plan
kW	Kilowatt
LNG	Liquefied Natural Gas
LOLE	Loss Of Load Expectation
LOLP	Loss Of Load Probability
LT	Long-Term
NREL	National Renewable Energy Laboratory
kW	Kilowatt
PPA	Power Purchase Agreement
PR100	Puerto Rico Grid Resilience and Transition to 100% Renewable Energy Study
PRP	Preferred Resource Plan
PV	Solar photovoltaic
PVRR	Present Value Revenue Requirement
RFI	Request for Information
RPS	Renewable Portfolio Standard
R&O	Resolution and Order
SJ	San Juan
ST	Short-Term
TM	Trailer-mounted
TPA	Transmission Planning Area
UBESS	Utility-scale Battery Energy Storage System

ACRONYM	DEFINITION
USE	Unserved Energy

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-001a-d

SUBJECT

BESS Cost Estimates

REQUEST

1. Reference: Confidential Final Input Assumptions Parameters and Costs 10_03-2025 Excel file, Section 7; and PLEXOS® results files, Section 8, with battery cost information on "Battery LT" tab.

    a. Currently, the trajectories of utility-scale BESS resources are identical on tabs "BuildCost High Cost" and "BuildCost Low Cost" in the Confidential Final Input Assumptions Parameters and Costs 10_03-2025 file. Confirm whether the BESS costs on the BuildCost Low-Cost tab are incorrect in the Inputs and Assumptions file.

    b. If confirmed, provide a revised Inputs and Assumptions file segment with the corrected low-cost BESS trajectory.

    c. If not confirmed, explain why not.

    d. Provide an explanation of how LUMA developed its low-cost BESS forecast, including any sources used.

RESPONSE

a. Confirmed. The information in the “BuildCost Low Cost” tab shown in the referenced file is inaccurate and does not contain the Utility-scale BESS (UBESS) costs used in PLEXOS® for the Low Case for UBESS. LUMA used a different set of values for the Low Case UBESS costs in the modeling which accurately reflects lower UBESS costs.

Scenario 4, and its resulting Resource Plan D, was the only scenario that used a Low Case version of the UBESS costs. The actual PLEXOS® modeling for Scenario 4 and Resource Plan D used the intended Low Case data provided in LUMA’s response to RFI-LUMA-AP-2023.0004-20251203-PREB-001b below.

In addition, the “BuildCost High Cost” forecasted costs of UBESS in the referenced file were not used in any of the Core or Supplemental Scenarios and are not relevant to the modeling results filed with the Energy Bureau.

b. Table 1 below provides the UBESS Base Cost used in the PLEXOS® modeling and included in the referenced spreadsheet, and the correct UBESS Low-Cost data used in the PLEXOS® modeling for Scenario 4 and Resource Plan D.

Table 1: UBESS Base Cost and Corrected Low Cost Forecast

Year	UBESS Base Case Cost ($/kW)(Nominal$)					UBESS Low Case Cost ($/kW)(Nominal$)					Annual Base to Low Inflator
	BESS - 2Hr	BESS - 4Hr	BESS - 6Hr	BESS - 8Hr	BESS-10HR	BESS - 2Hr	BESS - 4Hr	BESS - 6Hr	BESS - 8Hr	BESS-10HR	
2025	$2,590	$4,147	$5,704	$7,260	$10,357	$2,422	$4,064	$5,706	$7,348	$8,990	-11.0%
2026	$2,492	$3,964	$5,435	$6,906	$9,767	$2,373	$3,968	$5,564	$7,159	$8,754	-12.0%
2027	$2,393	$3,779	$5,165	$6,551	$9,176	$2,122	$3,535	$4,948	$6,360	$7,773	-13.0%
2028	$2,293	$3,593	$4,893	$6,193	$8,587	$2,018	$3,341	$4,664	$5,986	$7,309	-14.0%
2029	$2,191	$3,406	$4,621	$5,835	$8,001	$1,915	$3,149	$4,383	$5,617	$6,851	-14.9%
2030	$2,089	$3,218	$4,348	$5,477	$7,419	$1,812	$2,959	$4,106	$5,253	$6,401	-15.9%
2031	$2,015	$3,098	$4,181	$5,264	$6,885	$1,710	$2,772	$3,834	$4,895	$5,957	-16.7%
2032	$1,939	$2,974	$4,009	$5,045	$6,358	$1,610	$2,588	$3,566	$4,544	$5,522	-17.6%
2033	$1,860	$2,847	$3,834	$4,820	$5,838	$1,536	$2,465	$3,394	$4,323	$5,252	-18.6%
2034	$1,778	$2,716	$3,653	$4,591	$5,326	$1,461	$2,341	$3,221	$4,100	$4,980	-19.6%
2035	$1,695	$2,582	$3,469	$4,356	$4,824	$1,386	$2,216	$3,046	$3,877	$4,707	-20.9%
2036	$1,714	$2,606	$3,497	$4,388	$4,780	$1,310	$2,091	$2,872	$3,653	$4,434	-20.9%
2037	$1,734	$2,629	$3,524	$4,419	$4,731	$1,234	$1,966	$2,698	$3,430	$4,162	-20.9%
2038	$1,753	$2,652	$3,550	$4,449	$4,677	$1,235	$1,963	$2,691	$3,420	$4,148	-20.9%
2039	$1,773	$2,674	$3,575	$4,477	$4,617	$1,235	$1,960	$2,685	$3,410	$4,135	-20.9%
2040	$1,792	$2,696	$3,600	$4,504	$4,551	$1,238	$1,960	$2,682	$3,404	$4,127	-20.9%
2041	$1,811	$2,717	$3,623	$4,530	$4,569	$1,241	$1,961	$2,681	$3,402	$4,122	-20.9%
2042	$1,830	$2,738	$3,646	$4,554	$4,585	$1,244	$1,962	$2,680	$3,398	$4,116	-20.9%
2043	$1,848	$2,758	$3,667	$4,576	$4,599	$1,247	$1,962	$2,678	$3,393	$4,108	-20.9%
2044	$1,866	$2,777	$3,687	$4,597	$4,610	$1,250	$1,962	$2,674	$3,386	$4,098	-20.9%
2045	$1,885	$2,795	$3,706	$4,617	$4,622	$1,252	$1,961	$2,670	$3,379	$4,087	-20.9%
2046	$1,902	$2,813	$3,724	$4,634	$4,633	$1,254	$1,959	$2,664	$3,369	$4,075	-20.9%
2047	$1,920	$2,830	$3,740	$4,650	$4,645	$1,256	$1,957	$2,659	$3,360	$4,062	-20.9%
2048	$1,937	$2,846	$3,754	$4,663	$4,657	$1,258	$1,955	$2,653	$3,351	$4,049	-20.9%
2049	$1,954	$2,861	$3,767	$4,674	$4,668	$1,259	$1,954	$2,648	$3,342	$4,037	-20.9%
2050	$1,970	$2,874	$3,779	$4,684	$4,680	$1,261	$1,952	$2,643	$3,333	$4,024	-20.9%

c. See LUMA responses to RFI-LUMA-AP-2023.0004-20251203-PREB-001a and b above.

d. The Base Case UBESS cost estimates are based on the costs of the National Renewable Energy Laboratory (NREL) Advanced Technology Baseline (ATB) 2004 V3, multiplied by the NREL's Puerto Rico Grid Resilience and Transition to 100% Renewable Energy Study (PR100)[1]. The Low Case UBESS cost estimate was created by multiplying the Base Case

[1] PR100 study located at https://www.energy.gov/topics/pr100

costs by an annual percentage defined by LUMA, resulting in a material reduction to the UBESS Base Case costs.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-002 a-c

SUBJECT

Fuel Price Forecasts

REQUEST

2. Reference: IRP Report Section 7.1.2

   a. LUMA states that its unit fuel cost forecast for 2025 through 2028 was based on Henry Hub futures from December 2023 to January 2024. Please explain why LUMA did not update its fuel price forecast to reflect more recent Henry Hub market data that was available prior to filing the October 2025 IRP.

   b. Please state whether LUMA conducted any review or evaluation of more current natural gas price information during preparation of the 2025 IRP, and if so, provide that information. If not, explain why not.

   c. Please quantify the expected impact on the fuel price forecast had LUMA updated its forecast using more recently published Henry Hub data from late 2024 or 2025.

RESPONSE

   a. From early 2024 through 2025, LUMA reviewed natural gas market prices and determined that changes in pricing did not justify updating the Liquefied Natural Gas (LNG) price forecast, so the forecast was not revised.

   b. See response to item “2a” above and item “2c” below.

   c. Table 2 below provides the LNG forecast developed in January 2024 (Original 2024 Forecast), based on the 2023 Annual Energy Outlook (AEO) and Henry Hub futures pricing from December 2024 and used in the 2025 IRP, and an updated LNG forecast developed in December 2025 (Updated 2025 Forecast), based on the 2025 AEO and Henry Hub futures pricing available in December 2025. The Original Forecast is the LNG price forecast data used in all PLEXOS® modeling for the 2025 IRP. The Updated 2025 Forecast uses the same price differential from Henry Hub to Puerto Rico as in the Original 2024 Forecast, which includes estimated costs for transportation on the mainland USA, liquefaction, and ocean transportation to Puerto Rico. Using the annual LNG fuel consumption from the Preferred Resource Plan (PRP), Table 3 shows that the updated 2025 Forecast would result in an estimated 3.4% decrease in the total LNG costs. Table 3 also shows that using the updated 2025 Forecast would result in an estimated decrease to the cumulative Present Value Revenue Requirement (PVRR) for the PRP of 0.9%.

Table 2: Comparison of Original 2024 and Updated 2025 LNG Forecast

Year	Original 2024 Forecast			Updated 2025 Forecast			Annual Differential Percentage
	SJ LNG ($MMBTU)	EcoEléctrica LNG ($MMBTU)	Average SJ+ EcoEléctrica ($MMBTU)	SJ LNG ($MMBTU)	EcoEléctrica LNG ($MMBTU)	Average SJ+ EcoEléctrica ($MMBTU)	
2025	10.564	9.564	10.064	10.545	9.545	10.045	-0.2%
2026	10.913	9.913	10.413	11.337	10.337	10.837	4.1%
2027	10.957	9.957	10.457	11.110	10.110	10.610	1.5%
2028	10.916	9.916	10.416	10.894	9.894	10.394	-0.2%
2029	11.093	10.093	10.593	10.868	9.868	10.368	-2.1%
2030	11.296	10.296	10.796	10.821	9.821	10.321	-4.4%
2031	11.625	10.625	11.125	11.117	10.117	10.617	-4.6%
2032	12.022	11.022	11.522	11.844	10.844	11.344	-1.5%
2033	12.518	11.518	12.018	12.514	11.514	12.014	0.0%
2034	12.935	11.935	12.435	12.987	11.987	12.487	0.4%
2035	13.291	12.291	12.791	13.275	12.275	12.775	-0.1%
2036	13.470	12.470	12.970	13.415	12.415	12.915	-0.4%
2037	13.708	12.708	13.208	13.499	12.499	12.999	-1.6%
2038	14.120	13.120	13.620	13.588	12.588	13.088	-3.9%
2039	14.130	13.130	13.630	13.621	12.621	13.121	-3.7%
2040	14.606	13.606	14.106	13.846	12.846	13.346	-5.4%
2041	14.963	13.963	14.463	14.142	13.142	13.642	-5.7%
2042	15.137	14.137	14.637	14.422	13.422	13.922	-4.9%
2043	15.194	14.194	14.694	14.791	13.791	14.291	-2.7%
2044	15.311	14.311	14.811	15.100	14.100	14.600	-1.4%

2025 INTEGRATED RESOURCE PLAN

Table 3: Estimated PRP PVRR Impact of Updated 2025 Forecast

Year	Fuel Consumption By Fuel Type (Billion BTU)		Jan 2024 LNG Price Forecast			Dec 2025 LNG Price Forecast			PVRR Factor
	SJ+ Trucked LNG	EcoEléctrica LNG	SJ LNG ($MMBTU)	EcoEléctrica LNG ($MMBTU)	Total LNG Cost (Nominal $000)	SJ LNG ($MMBTU)	EcoEléctrica LNG ($MMBTU)	Total LNG Cost (Nominal $000)	
2025	45,901	35,508	$10.564	$9.564	$824,510	$10.545	$9.545	$822,968	0.857
2026	55,069	44,887	$10.913	$9.913	$1,045,957	$10.646	$9.646	$1,019,214	0.794
2027	50,368	46,980	$10.957	$9.957	$1,019,634	$10.705	$9.705	$995,110	0.735
2028	44,115	39,807	$10.916	$9.916	$876,296	$10.737	$9.737	$861,304	0.681
2029	43,653	36,388	$11.093	$10.093	$851,513	$10.718	$9.718	$821,498	0.630
2030	42,433	36,963	$11.296	$10.296	$859,909	$10.658	$9.658	$809,219	0.583
2031	41,949	36,053	$11.625	$10.625	$870,679	$10.942	$9.942	$817,474	0.540
2032	39,415	35,254	$12.022	$11.022	$862,424	$11.639	$10.639	$833,792	0.500
2033	58,395	34,804	$12.518	$11.518	$1,131,829	$12.282	$11.282	$1,109,873	0.463
2034	58,507	33,086	$12.935	$11.935	$1,151,642	$12.736	$11.736	$1,133,447	0.429
2035	56,686	33,316	$13.291	$12.291	$1,162,879	$13.013	$12.013	$1,137,909	0.397
2036	53,655	34,243	$13.470	$12.470	$1,149,694	$13.149	$12.149	$1,121,489	0.368
2037	53,256	33,416	$13.708	$12.708	$1,154,682	$13.229	$12.229	$1,113,204	0.340
2038	50,641	33,566	$14.120	$13.120	$1,155,403	$13.317	$12.317	$1,087,850	0.315
2039	46,480	31,505	$14.130	$13.130	$1,070,446	$13.349	$12.349	$1,009,511	0.292
2040	42,244	31,419	$14.606	$13.606	$1,044,470	$13.567	$12.567	$967,959	0.270
2041	35,667	30,874	$14.963	$13.963	$964,771	$13.851	$12.851	$890,797	0.250
2042	29,287	30,091	$15.137	$14.137	$868,724	$14.120	$13.120	$808,333	0.232
2043	26,101	27,160	$15.194	$14.194	$782,068	$14.473	$13.473	$743,668	0.215
2044	24,582	22,726	$15.311	$14.311	$701,623	$14.768	$13.768	$675,942	0.199
Total LNG PVRR					**$8,827,931**			**$8,527,604**	
Total LNG PVRR Differential								**($300,327)**	
Total LNG PVRR Differential								**-3.4%**	
Total PRP PVRR Impact								**-0.9%**	

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-003a

SUBJECT

Consolidated Workpapers

REQUEST

3. Reference: Consolidated Workpapers List - October 17, 2025, IRP Filing.xlsx: and LUMA Filed IRP - October 2025\LUMA files\Exh 2 Workpapers\05. Section 8 CONF\CONF PLEXOS Model. LUMA has not provided a sufficiently detailed "legend" to guide review of the workpapers.

    a. Provide an updated version of the "Consolidated Workpapers List" file or similar file that lists and explains the contents of the additional files contained within the "CONFIDENTIAL PLEXOS Model" subfolder. This should include files within both the "CSV files" and "GJW workfolder" subfolders. If the number of files is too numerous to list each one individually, LUMA may explain the files in groups for those that are similar.

RESPONSE

a. See file: ““RFI-LUMA-AP-2023.0004-20251203-PREB-003A”, which provides an updated and expanded version of the listing of the PLEXOS® model workpapers with an explanation of each file’s use.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-003b-c

SUBJECT

Consolidated Workpapers

REQUEST

3. Reference: Consolidated Workpapers List - October 17, 2025, IRP Filing.xlsx: and LUMA Filed IRP - October 2025\LUMA files\Exh 2 Workpapers\05. Section 8 CONF\CONF PLEXOS Model. LUMA has not provided a sufficiently detailed "legend" to guide review of the workpapers.

   b. For the files within the "CSV files" subfolder of the "CONFIDENTIAL PLEXOS Model" folder, provide a detailed description of how the filename relates to the specific PLEXOS iteration and how those files map to the "multi-step iterative PLEXOS modeling process " as depicted in Figure 73 of the IRP filing.

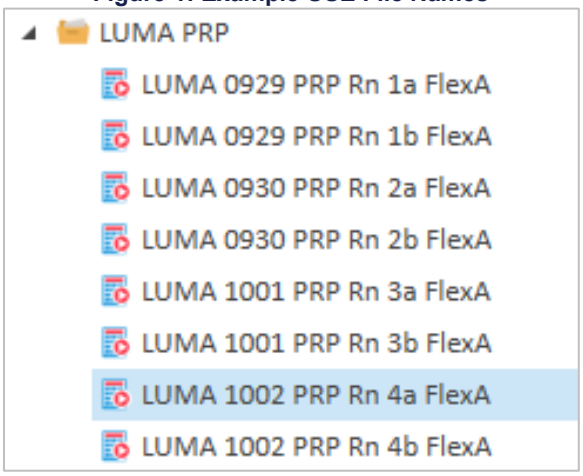
   c. Please identify for the files contained within the "CSV files" subfolder of the "CONFIDENTIAL PLEXOS Model" folder that correspond to specific scenario runs and share the same naming convention, which files represent the final versions. For example, indicate whether "LUMA 0930 Sc12 Hourly USE.xlsx" is the final version as compared to "LUMA 0917 Sc12 Hourly USE.xlsx".

RESPONSE

   b. See response to question “3a” above.

   c. The final version of the files used in the modeling can be identified through the dates associated with the dates in the PLEXOS® model. For example, the final Unserved Energy (USE) file used in the modeling of the PRP is titled “*LUMA 1001 Sc1 Rn 3b FlexA_ASAP.Batt Eff Solution Hourly USE*” since the last iteration for this scenario was the next iteration, i.e., 4a and 4b run on 10/02, which resulted in acceptable USE results as shown in Figure 1 below.

Figure 1: Example USE File Names



Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-003d

SUBJECT

Consolidated Workpapers

REQUEST

3. Reference: Consolidated Workpapers List - October 17, 2025, IRP Filing.xlsx: and LUMA Filed IRP - October 2025\LUMA files\Exh 2 Workpapers\05. Section 8 CONF\CONF PLEXOS Model. LUMA has not provided a sufficiently detailed "legend" to guide review of the workpapers.

    d. In workpapers like "LUMA 0102 Sc2ST Rnlb Hourly USE.csv" and similar, please explain the values provided, state what units the numbers are in, and whether columns B through I should be summed in order to get a system-wide result.

RESPONSE

a. The hourly USE files, as the name suggests, contain unserved energy across the system differentiated by the Transmission Planning Areas (TPA) in the system, at an hourly level for the entire study period. The units for these values are in megawatt (MW). Depending on the iteration step number, the unserved energy is either the unserved energy at the end of the Short-Term (ST) phase of the iteration (for iteration step #1) or is the cumulative unserved energy across the current and previous iterative steps, as described in "multi-step iterative PLEXOS® modeling process" as depicted in Figure 73 of the 2025 IRP Report.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-004a-d

SUBJECT

Outage and LOLE Modeling

REQUEST

4. Reference: IRP Report Sections 8.2.5-8.2.6 (Outage and LOLE Modeling), including ST Module model run results on an hourly basis.

   a. Provide the foundational results for all scenarios or state the specific source / filename reference in the workpapers that contain these results if already submitted. These results should show at minimum the hourly detail of forced outages and planned maintenance by unit.

   b. For each year of the planning horizon (2025 through 2044) provide the hourly ST and annual LT dispatch results for each iterative step for Scenario 1, the PRP, and Scenario 12, or state the specific source / filename reference in the workpapers that contain these results if already submitted. These hourly results should show at minimum the hourly detail of forced outages and planned maintenance by unit, as well as the unserved energy in each hour and the capacity builds and retirements per year.

   c. Provide the final hourly Gen ST, Battery ST, and Region ST results for Scenario 1, the PRP; and Scenario 12, or state the specific source / filename reference in the workpapers that contain these results if already submitted.

   d. Confirm, or explain otherwise that the final ST hourly run results provide the same energy generation results seen in aggregate on an annual basis in summary PLEXOS files provided in the Exhibit 2 folder "Confidential PLEXOS Solution spreadsheets".

RESPONSE

4. LUMA assumes the reference to the “ST Module model run results on an hourly basis” is intended to reference the ST module commitment and dispatch results in its PLEXOS® model used for the 2025 IRP. Based on the foregoing assumption, LUMA responds as follows:

   a. Refer to the PLEXOS® Model dataset titled “RFI-LUMA-AP-2023.0004-20251203-PREB-003A”, specifically the folder titled “CSV Files”, file “LUMA 0616 Sc1_Foundational outages existing units.csv” for the foundational outages of all existing units. Note that the results in this file are used for all the scenarios modeled as part of the current filing.

   b. Questions 4b, 4c, 4d, and 8d are interrelated and require significant time and resources to extract data from PLEXOS®, which covers a 20-year period across all scenarios, iterations, and hourly intervals. LUMA requests an extension by January 15, 2026, to provide detailed

responses to these questions. Additional responses to other questions may be refined based on the data extracted. LUMA expressly reserves the right to supplement, clarify, revise, or correct these responses.

c. See response to question “4b”.

d. See response to question “4b”.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-005a

SUBJECT

Planned and Forced Outages Rates Modeling

REQUEST

5. Reference: IRP filing pages 244-250, EUE, planned and forced outages, LOLE modeling in Plexos.

   a. Ref. page 248, "Further, by holding outages constant, there should be no variation in results, for example across scenarios, due to changes in generator outages". Confirm or explain otherwise that all forced outage result patterns and quantities are reflected in the same way across all scenarios.

RESPONSE

   a. Both the forced outage result patterns and quantities and planned maintenance outages are reflected in the same way across all scenarios for existing legacy units and for the units added or retired as Fixed Decisions. The forced outages and planned maintenance of newly added economic units are consistent with the multiple iterations used to arrive at acceptable EUE results. However, these patterns will vary between scenarios for newly added economic units.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-005b

SUBJECT

Planned and Forced Outages Rates Modeling

REQUEST

5. Reference: IRP filing pages 244-250, EUE, planned and forced outages, LOLE modeling in Plexos.

   b. Refer to page 175 of the IRP report where LUMA states that it developed its EUE targets to align with a timeframe that was "judged by LUMA to be sufficient for Genera to implement any planned improvements to existing generation units that would improve their reliability to sufficiently improve the forced outage rates and delay or eliminate future unit additions or retirements". Explain whether LUMA used the static forced outage rate assumptions from Table 45 for the whole study period or whether LUMA adjusted the forced outage percentages for any of the legacy units across the years in which they are included as available to the model to reflect ongoing capital and O&M investment in those units by Genera to improve their performance.

      I. If LUMA did change the forced outage rates, please provide the forecast.

      II. If LUMA did not update its outage rate forecast, please explain how this approach is consistent with the adjustments made to the EUE targets. Specifically, given that the EUE targets were lowered based on the assumption that Genera's planned capital and O&M investments would reduce forced outage rates, explain how maintaining a static outage rate does not conflict with the expectation that unit performance would improve over time.

RESPONSE

b. LUMA used the static Forced Outage Rate (FOR) assumptions from Table 45 for the whole study period.

   I. Not applicable, see response to "5.b" above.

   II. LUMA expects the EUE system performance (not the FOR performance of existing units) to improve based on the additions of new generation which will enable retirement of existing PREPA-owned generators or their relegation to operation roles requiring lower operating hours. LUMA is optimistic that the ongoing and planned Genera maintenance activities for PREPA-owned generation result in reduced FOR, reduced operating costs, and a longer operating life. Genera provided LUMA with a summary of ongoing and planned maintenance activities, but did not provide any estimates of the expected impacts to FOR. The current generation fleet has a

capacity-weighted average age of 46 years and a capacity-weighted average FOR of 29% (these averages exclude the TM and Mobile Pack units). Given the current age, condition, and FOR of the existing generation fleet, LUMA was not able to accurately forecast FOR impacts from Genera's maintenance activities. Therefore, LUMA chose what it believes to be the conservative and prudent approach by using existing FOR rates in the 2025 IRP modeling rather than developing resource plans based on the hope of meaningful improvements to the FOR of a generation fleet that averages 46 years in age.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-006a

SUBJECT

Forced Outage Rates

REQUEST

6. Reference: PLEXOS Solution Spreadsheets, including "CONFIDENTIAL_25.10.03 IRP Summary Results_Scl_HYBRID A - PRP.xlsm"

   a. Explain why the forced outage rate in column BA of both the Gen LT and Gen ST tabs frequently shows up as 0% for legacy plants with non-zero forced outage rate assumptions.

RESPONSE

a. LUMA used a multi-step iteration process to arrive at the results for each resource plan. As more fully described in the 2025 IRP Report, Section 8.2.6, the forced outage and planned maintenance outage rates were first defined in the foundational run, and then the combined forced and maintenance outage pattern was transferred to a “unit out” designation for that particular unit in all subsequent iterations. The forced and planned outage functionality in PLEXOS® was turned off to lock in the pattern of outages to limit the impacts of changing FOR patterns across scenarios and iterations. For those units where their outage pattern was transferred to a “unit out” designation, the FOR will show as 0% in later runs, since the forced outage modeling was fixed in.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-006b

SUBJECT

Forced Outage Rates

REQUEST

6. Reference: PLEXOS Solution Spreadsheets, including "CONFIDENTIAL_25.10.03 IRP Summary Results_Scl_HYBRID A - PRP.xlsm"

   b. State where to view actual annual forced outage rates by unit in the output files provided by LUMA.

RESPONSE

   b. See response to question “6a”. The annual FOR can be found in the input assumptions, located on the workpapers included as part of the PLEXOS database. Due to the iterative methodology used by LUMA and the transfer of forced and planned outage patterns to a unit out designation, the PLEXOS® result files do not contain the distinct FOR of all units.

   To see the annual FOR by units, please refer to the PLEXOS® Model dataset titled “RFI-LUMA-AP-2023.0004-20251203-PREB-003A”, specifically the folder titled “CSV Files”, file “LUMA 0616 Sc1_Foundational outages existing units.csv.”

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-007a

SUBJECT

Resource Plan Hybrid A

REQUEST

7. Reference: Resource Plan Hybrid A

   a. Clearly state the differences in assumptions between the scenarios that resulted in Core A, Core H, and Hybrid A.

RESPONSE

a. **Core A** - Based on Scenario 1, which had all characteristics set to the most likely or base case conditions. Biodiesel fuel was an optional source for PLEXOS® to choose from, since it could contribute to meeting or increasing Renewable Portfolio Standard (RPS) requirements. As part of these characteristics, the ASAP Phase 2 batteries were included as fixed decision additions with an installation date of 2026. All fixed decisions, including the ASAP Phase 2 batteries, are used as fixed or forced installations and retirements with no consideration of the need for the resource or their economics, relative to other optional resources.

   Core H – Based on Scenario 12 which had all the same characteristics as Scenario 1, with the exception that biodiesel was not available as an option. Without biodiesel being available, PLEXOS® was left with solar PV, wind, and renewable diesel as options to meet increasing RPS requirements. All fixed decisions, including the ASAP Phase 2 batteries, are used as fixed or forced installations and retirements with no consideration of the need for the resource or their economics, relative to other optional resources.

   Hybrid A – had all the same characteristics as Scenario 1 with two exceptions:

   i. The ASAP Phase 2 batteries were included as an optional resource that could be added by the model starting in 2027 or any year thereafter, as dictated by the need for the battery capacity and their relative economics compared to other optional resources.

   ii. The Utility-scale Battery Energy Storage System (UBESS) and Distributed Battery Energy Storage System (DBESS) round-trip charge-discharge efficiencies were changed to 85%, from the original settings of 90% for UBESS and 100% efficiency for DBESS. The original settings and the reason for the change are discussed in the 2025 IRP Report, Section 8.2.14.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-007b

SUBJECT

Resource Plan Hybrid A

REQUEST

7. Reference: Resource Plan Hybrid A

   b. On page 31 of the IRP, LUMA states that it further investigated both Resource Plans A and H. Please summarize the investigation and findings.

RESPONSE

   b. The further investigations of Resource Plans A and H refer to sensitivity runs to assess:

      i. Correcting UBESS and DBESS Roundtrip Efficiency - Modeling of results of changing the UBESS and DBESS round trip efficiency, as referred to in LUMA's response to question "7a" above and IRP Section 8.2.14.

      ii. Changing ASAP Phase 2 UBESS to Optional Additions - Modeling of results of changing the UBESS and DBESS round trip efficiency, as referred to in LUMA's response to question "7a" above and 2025 IRP Report Section 8.2.15.

   The PVRR results of these sensitivity analyses are discussed in Section 8.2.15 and summarized in Table 94 in the 2025 IRP Report.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203PREB-007c

SUBJECT

Resource Plan Hybrid A

REQUEST

7. Reference: Resource Plan Hybrid A

   c. Explain how changing the assumptions of Scenario 1 resulted in a lower cost portfolio for Hybrid A than Core A.

RESPONSE

c. Correcting the DBESS and UBESS round trip (or collectively BESS), charge-discharge efficiency from the original settings of 90% for UBESS and 100% efficiency for DBESS to the correct round trip efficiency of 85% for both types of BESS, increases the energy lost in the BESS charge-discharge cycle. Reducing efficiency and increasing the energy lost in the charge-discharge cycle, in turn, required more energy to be used for the charging portion of the cycle to obtain the same discharged energy, as what had been used in the prior run with the higher but erroneous efficiency values. The additional energy needed to compensate for the reduced round-trip efficiency required more fuel and variable operating and maintenance expenses to generate additional energy. The additional fuel and operating cost result in a slightly higher PVRR (0.1% higher than Core A) with the lower round-trip BESS efficiency. Sections 8.2.14 and 8.2.15 of the 2025 IRP Report provide a further discussion of this result.

As discussed in the 2025 IRP Report Section 6, in the original modeling runs for Scenarios 1 to 17, LUMA included as a fixed addition of 424.9 MW of ASAP Phase 2 capacity (assumed to include 1699.6 MWh energy capacity), added in December 2026, from a total of thirteen (13) individual UBESS projects. The results of changing the ASAP Phase 2 batteries to optional resources for Hybrid A showed that the ASAP Phase 2 batteries were not needed until much later, specifically in 2031 and 2037 for Hybrid A. Delaying the installation of these batteries also served to delay the start of their Power Purchase Agreement (PPA) contract payments, which served to reduce the PVRR for Hybrid A.

The savings from the change of the ASAP Phase 2 batteries to optional, more than compensated for the increase in PVRR caused by correcting the BESS efficiency. The combined PVRR savings from the two changes noted above served to decrease the PVRR of Core A sensitivity run by $0.47B. In these sensitivity runs, the changes were applied to the final iteration of Core A. As described in Section 8.2.20 of the 2025 IRP Report, LUMA then chose to combine these two changes (i.e., change ASAP Phase 2 to optional additions and correct BESS efficiency to 85%) in the initial assumptions of a new scenario which LUMA then modeled from the first iteration to the final iteration to attain acceptable EUE results. The

modeling of this new scenario yielded the Hybrid A Resource Plan, which showed a lower PVRR than the results of applying the ASAP and BESS efficiency changes to only the final iteration of Core A.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-007d

SUBJECT

Resource Plan Hybrid A

REQUEST

7. Reference: Resource Plan Hybrid A

   d. State whether changing the assumptions of Scenario 12 resulted in a lower cost portfolio for Hybrid H than Core H.

RESPONSE

   d. Performing sensitivity runs that changed the assumptions for the ASAP Phase 2 batteries to optional additions and corrected the BESS efficiency values, lowered PVRR for Core H (Table 94, in Section 8.2.15 of the 2025 IRP Report). There is no Hybrid H resource plan discussed in the 2025 IRP Report.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-008a

SUBJECT

Battery ST Items

REQUEST

8. Reference: PLEXOS Solution Spreadsheets, including "CONFIDENTIAL_25.10.03 IRP Summary Results_Scl_HYBRID A - PRP.xlsm, Tab "Battery ST". The annual capacity factors (between 2026 and the end of the modeling horizon) of the aggregate of Tranche 1, Tranche 2, Tranche 4, and new Genera Battery units on the "Battery ST" tab for the Scenario 1 Hybrid A PRP scenario in all but the last few years of the planning horizon are on the order of 5-6% (based on the "Generation MWh" field).

    a. This aggregate value is much less than the roughly 15-16% available maximum capacity factor for 4-hour battery resources. Confirm that the capacity factor for these aggregate battery resources as listed in the Battery ST tab is less than the maximum capability of the resource.

RESPONSE

    a. The capacity factor values in the PLEXOS® results are less than the available maximum capacity factors of the UBESS batteries in the resource plans.

Attachment A
NEPR-AP-2023-0004

Response: RFI-LUMA-AP-2023.0004-20251203-PREB-008b-d

SUBJECT

Battery ST Items

REQUEST

8. Reference: PLEXOS Solution Spreadsheets, including "CONFIDENTIAL_25.10.03 IRP Summary Results_Scl_HYBRID A - PRP.xlsm, Tab "Battery ST". The annual capacity factors (between 2026 and the end of the modeling horizon) of the aggregate of Tranche 1, Tranche 2, Tranche 4, and new Genera Battery units on the "Battery ST" tab for the Scenario 1 Hybrid A PRP scenario in all but the last few years of the planning horizon are on the order of 5-6% (based on the "Generation MWh" field).

    b. Does the PLEXOS model in ST module mode use these battery energy storage resources as part of its dispatch to reduce the incidence of Expected Unserved Energy (EUE) in the region between 2026 and the mid-2030s? As necessary, explain and discuss.

    c. If the dispatch solution in the ST module does use these resources to reduce EUE, why doesn't the model use the BESS at greater average annual capacity factors to further reduce the EUE in these years? If the dispatch solution in the ST module does not use these resources to reduce EUE, why not? Discuss and explain.

    d. If not already provided in response to question 4 c) above, provide the hourly ST file that contains the dispatch results illustrating how these battery resources were utilized and their contribution to reducing EUE.

RESPONSE

    b. Yes, BESS is used by PLEXOS® as needed to reduce EUE. When sufficient BESS charge is available, BESS resources will be dispatched by PLEXOS® to meet the load. Any needed transmission capacity is also available to move the BESS power to meet the load.

    c. PLEXOS® models the loads and resources in each hour and dispatches available resources, including batteries, to meet load and avoid EUE events if possible. Batteries are being dispatched to either eliminate or reduce unserved energy events and meet operating reserve requirements when they are available and charged. PLEXOS® is optimizing the charge and discharge of the BESS, factoring in BESS characteristics (e.g., rating, storage, losses, constraints, location). LUMA expects that battery capacity is consistently being dispatched to reduce or eliminate EUE events and is currently collecting the data to provide examples of this in its response to question “8d”.

    d. See response to question “4b” above. Question 8d is interrelated to questions 4b, 4c, and 4d that require significant time and resources to extract data from PLEXOS®, which covers a 20-

year period across all scenarios, iterations, and hourly intervals. LUMA requests an extension by January 15, 2026, to provide detailed responses to these questions. LUMA expressly reserves the right to supplement, clarify, revise, or correct these responses.