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

IN RE: REVIEW OF LUMA'S INITIAL BUDGETS	**CASE NO. NEPR-MI-2021-0004** **SUBJECT: Motion Submitting Fiscal Year 2023 Annual Budget as Approved and Certified by the Financial Oversight and Management Board for Puerto Rico**

MOTION SUBMITTING FISCAL YEAR 2023 ANNUAL BUDGET AS APPROVED AND CERTIFIED BY THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO

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 April 2, 2022 at 12:23am, LUMA submitted to this Honorable Puerto Rico Energy Bureau of the Public Service Regulatory Board, proposed Annual Budgets for fiscal years 2023 through 2025 ("Annual Budgets"). As expressed at the time, despite the circumstances beyond LUMA's control impacting fuel costs, LUMA did not seek an increase or revision in the base rate, overall revenue requirements or a change in the current rate structure. That is, LUMA did not request an increase to customer rates related to LUMA's operation of the T&D System.

2. The Annual Budgets included LUMA's allocation of total spending limits to remain compliant with the 2017 Rate Order among the budgets and included a Generation Budget as provided by the Puerto Rico Electric Power Authority ("PREPA") to LUMA on April 1, 2022.

3. In addition, LUMA submitted the Annual Budgets to the Puerto Rico Public-Private Partnerships Authority ("P3A") in compliance with the *Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement* ("T&D OMA").

4. On May 11, 2022, P3A notified LUMA that it had reviewed the proposed Annual Budgets and concluded that LUMA's Fiscal Year 2023 Budget is compliant with the 2017 Rate Order.

5. On May 19, 2022, this Puerto Rico Energy Bureau ("Energy Bureau") issued a Resolution and Order ("May 19 Order") whereby it scheduled a Virtual Technical Conference for June 10, 2022 and ordered LUMA to file the presentation to be used during said conference on or before June 7, 2022. This Energy Bureau stated that "[d]uring the Virtual Technical Conference, LUMA shall present and discuss thoroughly the proposed FY2023 Budgets. LUMA representatives and their consultants must be prepared to answer questions under oath from the Energy Bureau, its staff, and consultants, regarding its presentation and all aspects of the proposed FY2023 Annual Budgets." *See*, May 19 Order at page 8. Through the May 19 Order, the Energy Bureau also issued approximately 116 requirements for information and established a procedural schedule in this proceeding.

6. In compliance with the May 19 Order, through separate filings dated May 26, June 3 and 7, 2022, LUMA and PREPA submitted their responses to the Energy Bureau's Requirements for Information.[1]

7. On June 7, 2022, this honorable Energy Bureau entered a Resolution and Order whereby it set the Agenda for the Virtual Technical Conference.

[1] The ROIs totaled 116 requirements, including subparts. LUMA responded to all of them, except for Requirements nos. A7, A8, A9, F1, F2, F3(A)-(C), F4, F5(A)-(E), F6(A)-(E), F7, F8, F9(A), F10(A)-(D) which were responded to by PREPA.

8. Upon filing its application, LUMA began preparing for the Virtual Technical Conference in compliance with this honorable Bureau's directive to be prepared to "present and discuss thoroughly the proposed FY2023 Budgets" and have its "representatives and consultants…prepared to answer questions under oath from the Energy Bureau…regarding its presentation and all aspects of the proposed FY2023 Budgets." LUMA employees and consultants appeared at the June 10 Virtual Technical Conference to offer testimony and were prepared, as instructed by this Energy Bureau, to answer the honorable Bureau's questions regarding the Annual Budgets for the period of 2023-2025.

9. On June 10, 2022, at the outset of the Virtual Technical Conference, the Energy Bureau issued a bench order postponing the conference to allow LUMA and PREPA the week to revise a consolidated budget proposal within the 2017 Rate Order. The Energy Bureau provided that the Technical Conference would continue on June 17, 2022.[2]

10. On June 15, 2022, this Energy Bureau entered a Resolution and Order (the "June 15 Order") whereby it required LUMA to *certify* certain information in anticipation of the Virtual Technical Conference. Specifically, the Energy Bureau requested that LUMA certify that:

> (i) LUMA has concluded all the actions required by the Parties of the OMA to obtain a consolidated budget, including, but not limited to any budget dispute resolution available to the Parties.
>
> (ii) LUMA assures that the FY2023 consolidated Budget takes into consideration all savings LUMA has been able to achieve for such budget and such savings are made available to both the T&D Budget and the Generation Budget, which along with other measures, assures that a rate increase is not required.
>
> (iii) LUMA will use such consolidated budget, in full compliance and according to the OMA, during the June 17 Technical Conference.

[2] LUMA moved for reconsideration of the bench order and it was denied. This Energy Bureau soon thereafter closed the record and ended the proceedings. The parties were directed to file motions with any arguments or requests that they may have.

The Energy Bureau further determined that "in the event that LUMA cannot provide such certification, **the June 17 Technical Conference and the June 24, 2022 Virtual Public Hearing are automatically postponed**, and as agreed by the Parties to the OMA, the Default Budget shall remain in effect until such time as the FY2023 consolidated Budget is submitted and approved by the Energy Bureau." *See*, June 15 Order at page 2.

11. LUMA filed a *Motion to Inform Status of Negotiations Relating to Generation Budget and in Compliance with Order of June 15, 2022* whereby it objected the Energy Bureau's demand for a certification not contemplated by the laws and regulations applicable to the approval of the proposed Annual Budgets nor by the T&D OMA. LUMA also informed the status of LUMA's efforts carried out with PREPA to reach an understanding with regards to the Generation Budget which, as of that date, had not resulted in an agreement as to the Generation Budget.

12. Specifically, LUMA informed that, as of June 16th, it had completed the actions required by the T&D OMA and continued working collaboratively on the budgets with PREPA, the P3A, and the Financial Oversight and Management Board for Puerto Rico ("FOMB"), but at the time due to PREPA's disagreement with the Generation Budget and allocation of rates that were submitted on April 1, 2022, LUMA could not file a consolidated budget in compliance with the 2017 Rate Order with the Energy Bureau. Consequently, the June 17th Technical Conference and the June 24th Public Hearing were automatically postponed.

13. In a Resolution and Order dated June 22, 2022, sixteen (16) days after receiving the Revised Budget Amendment for FY 2022, this Energy Bureau required that on or before Monday, June 27, 2022, LUMA shall submit responses to a request for information dealing with the Energy Bureau's order to submit an independent assessment of the load forecast and a request for

information regarding LUMA's Revised Budget Amendment that included four requests for information with fourteen (14) questions ("June 22nd Request for Information").[3]

14. From June 10, 2022 and thereafter, LUMA continued working with the P3A, the FOMB and PREPA on the consolidated budgets. As a result of that process, on June 30, 2022, the FOMB issued a *Resolution Certifying the Fiscal Year 2023 Budget for PREPA* pursuant to Sections 202(c) of PROMESA (the "June 30th FOMB Resolution"). *See*, Letter dated June 30, 2022 from Mr. David A. Skeel, Jr., Chair of the FOMB to Jr. to the Hon. Pedro Pierluisi Urrutia, Governor of Puerto Rico, along with its Exhibit A, copy of which is attached as **Exhibit 1**.

15. As expressed in the June 30th FOMB Resolution, after extensive deliberations, the FOMB concluded that the FY2023 Budget for PREPA did not reflect a compliant budget as required by Section 202(c)(2) of Puerto Rico Oversight, Management, and Economic Stability Act ("PROMESA"). Therefore, the FOMB developed a revised, compliant FY2023 Budget pursuant to Sections 202(c)(2) and 202(e)(4) of PROMESA ***which was deemed approved by the Governor and in full force beginning on July 1, 2022***. *See*, Resolution at page 2.

16. LUMA hereby respectfully submits as **Exhibit 2** the FY2023 Budget as certified by the FOMB (the "Certified Budget"). **Exhibit 3** contains the updated Schedules thereto in *Excel* format.

17. As per **Exhibit 2**, the Certified Budget does not represent major modifications to LUMA's Proposed T&D Budget as originally submitted to this honorable Energy Bureau. LUMA's Transmission and Distribution operational expenditures and non-federally funded capital for Fiscal Year 2023 Budget remained the same within the Certified Budget, as shown in **Exhibit 2**. However, the Certified Budget has a reduction in Generation and HoldCo Budgets. In addition, in the Certified Budget the FOMB revised its assumption for PREPA to exit Title III by June 30,

[3] On July 6, 2022, LUMA filed a *Motion Submitting Responses in Compliance with Resolution and Order of June 22, 2022* whereby it submitted its responses to the June 22nd Request for Information.

2023 (specifically increasing LUMA Fees in accordance with the T&D OMA) and reduced Bad Debts. The Certified Budget is the result of meticulous review by the FOMB and P3A as well as the efforts conducted by the parties during the past month as described above.

18. Act 57-2019 provides that the Energy Bureau "shall oversee and ensure the execution and implementation of the public policy on the electric power service of the Commonwealth of Puerto Rico." Section 6.3(a). The Energy Bureau is also charged with the power to "review and approve and, if applicable, modify the rates or fees charged by electric power service companies in Puerto Rico in connection with any matter directly or indirectly related to the provision of electric power services." Section 6.3(k). The foregoing is subject, however, to Section 4 of PROMESA, which at Section 4 establishes that its provisions "shall prevail over any general or specific provisions of territory law, State law, or regulation that is inconsistent with [PROMESA]." 48 U.S.C. §2103.

Request for Confidentiality:

19. LUMA incorporates by reference as if fully set forth herein in its entirety, its *Memorandum of Law in Support of Confidential Treatment of Portions of Appendix of LUMA's Annual Budgets* filed on April 2, 2022. Therefore, for the reasons stated therein, LUMA respectfully requests that pursuant to the applicable laws and regulations discussed at length in the Confidentiality Memorandum, this Honorable Energy Bureau keep confidentially the following portions of Appendix C of the Certified Annual Budget identified in compliance with the Energy Bureau's Policy of Management of Confidential Information.

Identification of Confidential Information:

Document	Pages in which Confidential Information Is Found	Date of Filing	Summary of Legal Basis for Confidentiality Protection	Summary of Reasons Why Each Claim Conforms to Legal Basis for Confidentiality
Appendix C Certified Annual Budgets **Distribution Streetlighting**, **HR Programs**, and **Waste Management**	Distribution Streetlighting, Section 3.3; First and Fourth Bullet at pages 83-84 HR Programs, Section 3.3; First bullet at page 337 Waste Management, Section, 3.3; Third bullet at page 417	July 13, 2022	Sensitive Commercial Information and Trade Secrets under Act 80-2011	Section III A of this Memorandum discusses and shows that the specified portions of Appendix C include information for future acquisitions of good and services that may provide unfair advantages to suppliers or proponents and could harm the public interest.
Appendix C Certified Annual Budgets **Critical Energy Management System Upgrades**	Sections 2.1 -2.6, pages 200-202	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.
Appendix C Certified Annual Budgets **Critical Energy Management & Load Generation Balancing**	Sections 2.1 -2.6, Pages 217-220	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.

Appendix C Certified Annual Budgets **Control Center Construction & Refurbishment**	Sections 2.1 -2.6, Pages 210-213		Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.
Appendix C Certified Annual Budgets **IT OT Telecom Systems & Networks**	Sections 2.1 -2.6, Pages 158-164	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.
Appendix C Certified Annual Budgets **IT OT Cybersecurity Program**	Sections 2.1 -2.6, Pages 358-363	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.
Appendix C Certified Annual Budgets **Substation Security**	Sections 2.1 -2.6, Pages 186-189	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.
Appendix C Certified Annual Budgets **Regional & Technical Facilities Security**	Sections 2.1 -2.6, Pages 195-196	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.
Appendix C Certified Annual Budgets **Warehouse Security**	Sections 2.1 -2.6, Pages 214-216	July 13, 2022	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section III B of this Memorandum provides the legal basis to establish that that the specified sections of Appendix C to the Annual Budgets includes confidential information.

WHEREFORE, LUMA respectfully request that this Energy Bureau **take notice** of the Certified Annual Budget.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this July 13, 2022.

I hereby certify that I filed this motion using the electronic filing system of this Energy Bureau and that I will send an electronic copy of this Petition to the attorneys for PREPA, Joannely Marrero-Cruz, jmarrero@diazvaz.law; and Katiuska Bolaños-Lugo, kbolanos@diazvaz.law.

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Exhibit 1

Letter dated June 30, 2022 from Mr. David A. Skeel, Jr., Chair of the FOMB to the Hon. Pedro Pierluisi Urrutia, Governor of Puerto Rico, along with its Exhibit A

FINANCIAL OVERSIGHT & MANAGEMENT BOARD
FOR PUERTO RICO

David A. Skeel, Jr.
Chair

Members
Andrew G. Biggs
Arthur J. González
Antonio L. Medina
John E. Nixon
Justin M. Peterson
Betty A. Rosa

BY ELECTRONIC MAIL

June 30, 2022

The Honorable Pedro Pierluisi Urrutia
Governor of Puerto Rico

Dear Governor Pierluisi Urrutia:

Pursuant to a Resolution, a copy of which is attached hereto as **Exhibit A** (the "Resolution"), adopted by the Financial Oversight and Management Board for Puerto Rico (the "Oversight Board"), and to Section 202(e)(4) of the Puerto Rico Oversight, Management, and Economic Stability Act ("PROMESA"), the Oversight Board hereby issues to the Governor this compliance certification that the fiscal year 2023 budget for the Puerto Rico Electric Power Authority ("PREPA"), attached as **Exhibit 1** to the Resolution (the "Fiscal Year 2023 Budget for PREPA"), is a compliant budget as set forth in the Resolution.

The Oversight Board looks forward to working with you and PREPA to fully implement the Fiscal Year 2023 Budget for PREPA for the benefit of the people of Puerto Rico.

Sincerely,

David Skeel

David A. Skeel, Jr.

Andrew G. Biggs
Arthur J. González
Antonio L. Medina
John E. Nixon
Justin M. Peterson
Betty A. Rosa

CC: Mr. Jaime A. El Koury
Hon. Omar Marrero Díaz
PREPA Governing Board

EXHIBIT A

FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO

June 30, 2022

RESOLUTION CERTIFYING THE FISCAL YEAR 2023 BUDGET FOR PREPA

WHEREAS, on June 30, 2016, the federal Puerto Rico Oversight, Management, and Economic Stability Act ("PROMESA") was enacted; and

WHEREAS, Section 101 of PROMESA created the Financial Oversight and Management Board for Puerto Rico ("the Oversight Board"); and

WHEREAS, Section 202(c) of PROMESA establishes a multi-step procedure for the development, review, and approval of a budget for covered instrumentalities of the Commonwealth of Puerto Rico, such as the Puerto Rico Electric Power Authority ("PREPA"), providing that (i) the Governor must submit a proposed budget to the Oversight Board; (ii) the Oversight Board must review the proposed budget and determine, in the Oversight Board's sole discretion, either that the proposed budget complies with the applicable fiscal plan or that it does not, in which case the Oversight Board must issue a notice of violation and recommended revisions, giving the Governor an opportunity to correct the violations; (iii) the Governor may then submit a revised proposed budget; and (iv) if the Governor fails timely to submit a proposed budget that the Oversight Board determines in its sole discretion is a compliant budget, the Oversight Board shall develop and submit to the Governor its own compliant budget; and

WHEREAS, by letter dated February 22, 2022, the Oversight Board, pursuant to Section 202(a) of PROMESA, submitted to the Governor a schedule for developing, submitting, approving, and certifying the Fiscal Year 2023 Budget for PREPA; and

WHEREAS, from June 15, 2022 through June 17, 2022, PREPA's representatives, the Oversight Board's staff and consultants, the Puerto Rico Public-Private Partnerships Authority's (P3A) staff and consultants, and attorneys engaged in discussions about the Fiscal Year 2023 Budget for PREPA and the Oversight Board's concerns regarding the budget; and

WHEREAS, on June 22, 2022, the Governor submitted the proposed Fiscal Year 2023 Budget for PREPA; and

WHEREAS, the Oversight Board and its advisors held discussions with the Governor's representatives regarding the proposed Fiscal Year 2023 Budget for PREPA; and

WHEREAS, after substantial deliberations, on June 28, 2022, the Oversight Board sent to the Governor a notice of violation pursuant to Section 202(c)(1)(B) of PROMESA regarding the Governor's proposed Fiscal Year 2023 Budget for PREPA; and

WHEREAS, the Governor did not submit a revised proposed Fiscal Year 2023 Budget for PREPA by the established deadline; and

WHEREAS, after substantial deliberations, the Oversight Board determined that the proposed Fiscal Year 2023 Budget for PREPA does not reflect a compliant budget as required by Section 202(c)(2) of PROMESA; and

WHEREAS, the Oversight Board has developed a revised, compliant Fiscal Year 2023 Budget for PREPA for submission to the Governor pursuant to Sections 202(c)(2) and 202(e)(4) of PROMESA, which budget is attached hereto as Exhibit 1 (the "Compliant 2023 PREPA Budget");

NOW, THEREFORE, IT IS HEREBY RESOLVED THAT, pursuant to Sections 202(c)(2) and 202(e)(4) of PROMESA, the Oversight Board shall submit to the Governor the Compliant 2023 PREPA Budget, and such budget shall be (i) deemed to be approved by the Governor, (ii) the subject of a compliance certification to be issued by the Oversight Board to the Governor, and (iii) in full force and effect beginning on July 1, 2022.

EXHIBIT 1: PUERTO RICO ELECTRIC POWER AUTHORITY FISCAL YEAR 2023 COMPLIANT BUDGET AND BUDGETARY RESOLUTIONS PROVISIONS

I. EXHIBIT 1 - BUDGET - REVENUES PUERTO RICO ELECTRIC POWER AUTHORITY

$ Thousand		FY23 Budget
Basic Revenue		
Residential		418,469
Commercial		585,076
Industrial		101,425
Public Lighting		60,749
Agricultural		1,962
Others		2,217
Total	**$**	**1,169,899**
Fuel & Purchased Power		
Residential		1,458,820
Commercial		1,543,555
Industrial		377,871
Public Lighting		48,729
Agricultural		4,603
Others		7,838
Total	**$**	**3,441,415**
CILT		
Residential		47,879
Commercial		50,660
Industrial		12,402
Public Lighting		1,599
Agricultural		124
Others		257
Total	**$**	**112,950**
Subsidies		
Residential		101,790
Commercial		107,702
Industrial		26,366
Public Lighting		3,400
Agricultural		327
Others		547
Total	**$**	**240,132**
Total Gross Revenue	**$**	**4,964,396**
Other Income		37,358
Total Unconsolidated Revenue	**$**	**5,001,754**
Bad Debt Expense		(74,466)
CILT & Subsidies		(353,082)
Total Consolidated Revenue	**$**	**4,574,206**

II. EXHIBIT 1 BUDGET - EXPENSES (*cont'd*)
PUERTO RICO ELECTRIC POWER AUTHORITY

$ Thousand	FY23 Budget
A. Fuel & Purchased Power	
Fuel	2,889,990
Purchased Power - Conventional	472,207
Purchased Power - Renewable	79,217
Total Fuel & Purchase Power Expenses	**$ 3,441,415**
B. GenCo - Operations & Maintenance Expenses	
Labor	
Salaries & Wages	45,511
Pension & Benefits	28,904
Overtime Pay	11,733
Overtime Benefits	1,395
Total GenCo Labor Operating Expenses	**87,543**
Non-Labor / Other Operating	
Materials & Supplies	19,795
Transportation, Per Diem, and Mileage	1,527
Security	9,043
Utilities & Rents	3,623
Legal Services	7,405
Professional & Technical Outsourced Services	2,392
Regulation & Environmental Inspection	7,945
Other Miscellaneous Expenses	7,565
Total GenCo Non-Labor / Other Operating Expenses	**59,294**
Shared Services Agreement Impact	**59,748**
Total GenCo Operating Expenses	**206,585**
Maintenance	
Generation	99,039
Total GenCo Maintenance Projects Expense	**99,039**
Federal Funding Cost Share	-
Total GenCo Operating & Maintenance Expenses	**$ 305,624**

EXHIBIT 1 BUDGET - EXPENSES (*cont'd*) PUERTO RICO ELECTRIC POWER AUTHORITY

$ Thousand		FY23 Budget
C. HoldCo - Operations Expenses		
Labor		
Salaries & Wages		7,513
Pension & Benefits		4,508
Overtime Pay		439
Overtime Benefits		53
Total HoldCo Labor Operating Expenses		**12,513**
Non-Labor / Other Operating Expenses		
Materials & Supplies		288
Transportation, Per Diem, and Mileage		242
Retiree Medical Benefits		9,000
IT Service Agreements		850
Utilities & Rents		36
Communications Expenses		81
Professional & Technical Outsourced Services		4,144
Other Miscellaneous Expenses		1,825
PREPA Restructuring & Title III		25,100
FOMB Advisor Costs allocated to PREPA		24,400
Total HoldCo Non-Labor / Other Operating Expenses		**65,966**
Total HoldCo Operating Expenses	**$**	**78,479**
D. GridCo - Operating & Maintenance Expenses		
GridCo Labor Operating Expenses		**246,471**
GridCo Non-Labor / Other Operating Expenses		**289,926**
Operator Service Fees		**121,785**
2% Reserve		**10,728**
Maintenance Projects Expenses		**79,778**
Total GridCo Operating & Maintenance Expenses	**$**	**748,688**
Total Operating & Maintenance Expenses	**$**	**4,574,206**
Surplus / (Deficit) Before Legacy Pension and Debt Obligations		0

III. ENFORCEMENT OF THE PUERTO RICO ELECTRIC POWER AUTHORITY FY23 BUDGET

Section 2.- All expenditures authorized in any prior fiscal year are terminated and no disbursement of public funds may be covered by such expenditure authorization, except: (1) expenditures to carry out capital improvements that have been accounted for and kept on the books; (2) capital and maintenance expenditures with procurement cycles that extend beyond the end of the fiscal year that have been accounted for and kept on the books; (3) the portion of any other expenditures authorized in the Puerto Rico Electric Power Authority ("PREPA") Certified Budget for fiscal year 2022; and (4) the portion of the appropriations authorized for fiscal year 2022 that have been allocated, transferred or designated on or before June 30 of such fiscal year. This restriction on expenditures authorized in any prior fiscal year shall not apply to: (i) programs financed in whole or part with federal funds; (ii) orders by the United States district court with jurisdiction over all matters under Title III of PROMESA; and (iii) matters pertaining to any consent decree or injunction, or an administrative order or settlement entered into with a Federal Agency, with respect to Federal programs. In addition, the foregoing exceptions to the restrictions on expenditures authorized in any prior fiscal year are conditioned on the prior written approval of the Oversight Board.

Section 3.- On or before August 31, 2022, the Executive Director of PREPA will provide to the Oversight Board a certification indicating whether there are any unused amounts of the fiscal year 2022 certified budget for items (1), (2), (3), and (4) of Section 2 and, if so, an itemization of such unused amounts.

Section 4.- Notwithstanding any other statement, no unused budget allotments from any previous fiscal year shall be used by PREPA to fund current fiscal year expenditures, except as otherwise expressly authorized by the Oversight Board in writing after June 30, 2022.

Section 5.- The Executive Director of PREPA shall be responsible for not spending or encumbering during fiscal year 2023 any amount that exceeds the expenditures authorized for GenCo and HoldCo herein for fiscal year 2022, other than amounts above those budgeted for fuel and purchased power, which may fluctuate based on market factors or increase due to unforeseen expenses necessary to maintain the electric system's reliability and safety.

Section 6.- Except for additional expenditures related to fuel and purchased power, the expenditures approved in this budget, including payroll and related expenses, may only be reprogrammed with the prior express written approval of the Oversight Board. For the avoidance of doubt, this prohibition includes any reprogramming of any amount, line item or expenditure provided in this budget. In the case of reprogramming to the fuel and purchased power budget, the Executive Director of PREPA must provide written notice to the Oversight Board of any change to such amounts within 5 days after any such change taking place.

Section 7.- Pursuant to Section 203 of PROMESA, PREPA must submit to the Oversight Board, no later than 15 days after the last day of each quarter of fiscal year 2023, a budget to actual report, along with an explanation of relevant variances as provided in the certified Fiscal Plan. The Oversight Board may determine to provide PREPA a template to be used for such reporting, in which case any quarterly budget to actual reports submitted by PREPA must be submitted consistent with such reporting template.

Section 8.- The Oversight Board reserves the right to, in its sole discretion, issue a notice to the Governor, pursuant to PROMESA Section 202(a), setting forth a schedule for revising PREPA's budget.

Section 9.- The PREPA budget for FY2023 shall take effect on July 1, 2022.

Exhibit 2
FY2023 Certified Budget



Presupuestos Anuales de LUMA

Años fiscales 2023 - 2025

¿Quiénes somos?

LUMA y nuestros sobre 3,000 compañeros trabajan arduamente todos los días para construir un sistema energético que esté centrado en el cliente y sea más confiable, resistente, y limpio para los 3.2 millones de amigos, familiares y vecinos que tenemos el privilegio de servir. Estamos comprometidos con constantemente mejorar la infraestructura y construir la red eléctrica de última generación que los puertorriqueños esperan y merecen.

Creados para
Comprometidos con
Escuchando a
Puerto Rico





Nuestra Misión para Puerto Rico

Recuperar y transformar el sistema eléctrico para proveer un servicio energético confiable, resiliente, y limpio.

OBJETIVOS CLAVE

LA SEGURIDAD ES PRIORIDAD

Reestructurar las actividades del sistema eléctrico para apoyar una cultura de seguridad fuerte centrada en la seguridad de los empleados y el pueblo puertorriqueño.

MEJORAR LA SATISFACCIÓN DEL CLIENTE

Transformar las operaciones para ofrecer una experiencia positiva al cliente y una electricidad confiable a precios razonables.

RECONSTRUCCIÓN Y RESILIENCIA DEL SISTEMA

Utilización efectiva de fondos federales para restaurar la red y mejorar la resistencia de las infraestructuras vulnerables

EXCELENCIA OPERACIONAL

Ayudar a los empleados a alcanzar la excelencia operacional a través de nuevos sistemas, procesos y capacitaciones.

TRANSFORMACIÓN ENERGÉTICA SOSTENIBLE

Modernizar la red eléctrica para lograr un sistema energético sustentable.

Resumen Ejecutivo

Nuestro presupuesto propuesto para el periodo julio 2022 a junio 2023 permitirá que los más de 3,000 trabajadores de LUMA continúen construyendo un sistema energético que esté centrado en el cliente y sea más confiable, resistente y limpio para nuestros clientes y para todo Puerto Rico—sin aumentar la tarifa base que impactaría las facturas de los clientes.

Estamos conscientes de la importancia de la asequibilidad y sabemos que los eventos recientes a nivel mundial han causado un aumento significativo en los costos de combustible para generar energía y esto ha resultado en un aumento en las tarifas.
Estos aumentos en las tarifas están fuera del control de LUMA.

PARA SER CLAROS, LUMA NO:

- Genera energía
- Controla el impacto de los costos de combustible en las tarifas de nuestros clientes

Pero sí gestionamos los costos relacionados a la operación de la red de Transmisión y Distribución y si esta gestión resultaría en un aumento en la tarifa base.

Como se indica en nuestro presupuesto anual para el Año Fiscal 2023, LUMA no solicita un aumento en las tarifas de los clientes en relación con la operación del sistema de transmisión y distribución.

Propuesta de presupuesto de LUMA

Sin aumento en la tarifa base

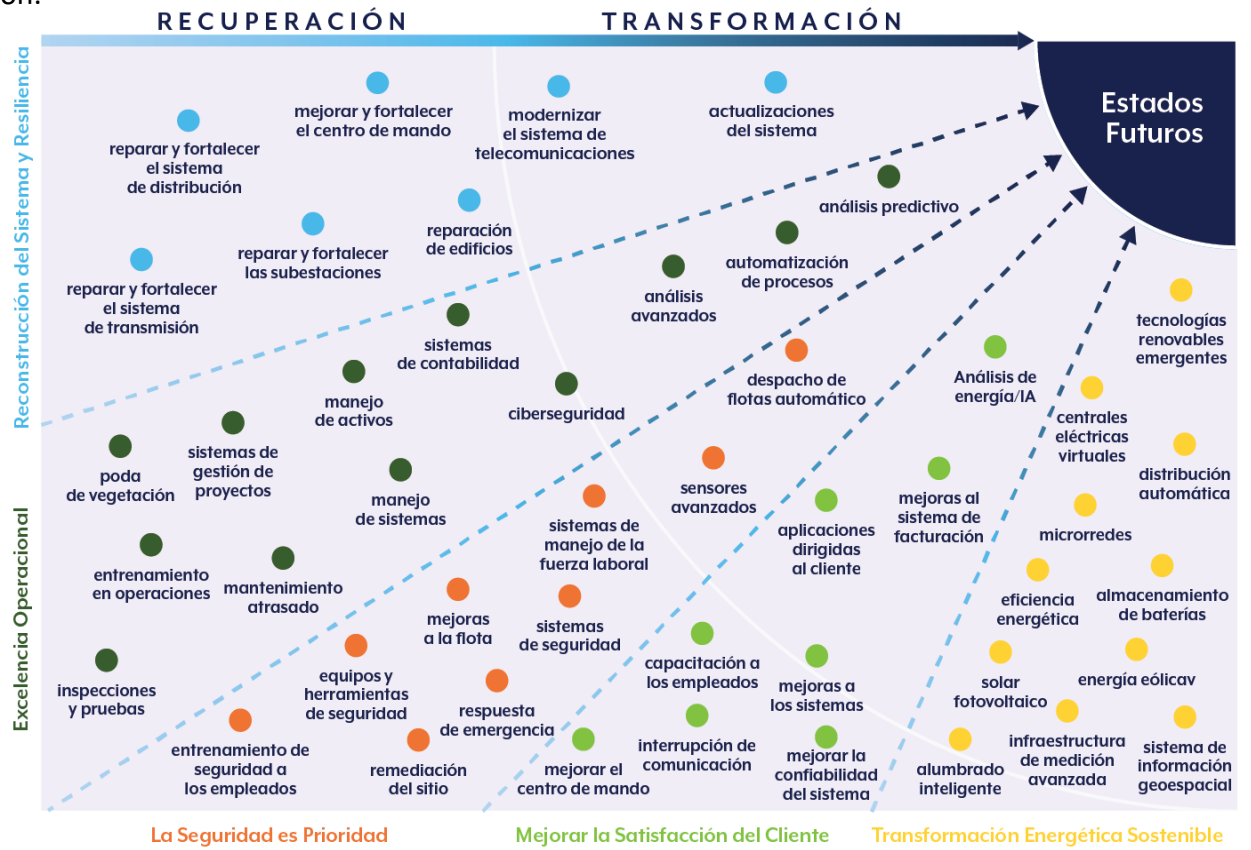
Prioridades Claves

Sin aumentar las tarifas, seguiremos enfocados en los programas anuales de recuperación y resiliencia del sistema que establecerán la base necesaria para llevar a cabo la transformación eléctrica en todo Puerto Rico.

- REPARACIÓN Y REEMPLAZO DE POSTES, LUCES Y SUBESTACIONES
- MEJORAR LA EXPERIENCIA DEL CLIENTE
- AUMENTAR LA GESTIÓN DE VEGETACIÓN
- PREPARARNOS PARA LAS EMERGENCIAS
- INVERTIR EN SEGURIDAD Y FORMACIÓN DE CELADORES
- FOMENTAR LA ENERGIA RENOVABLE
- UTILIZAR NUEVA TECNOLOGÍA PARA PUERTO RICO

Marco de recuperación y transformación

LUMA continúa priorizando los programas para mejorar el sistema usando los objetivos establecidos por la política pública energética de Puerto Rico y resumidos en el Marco de recuperación y transformación para garantizar que se realicen los cambios adecuados en el momento oportuno. Así, estaremos añadiendo valor a nuestros clientes y cumpliendo con los requisitos legales, reglamentarios y contractuales. El plan de inversión de LUMA se caracteriza por un énfasis a corto plazo en los programas fundamentales de recuperación para mejorar tanto la infraestructura como la condición de la organización, mientras que también se prepara el camino para continuar enfocándonos más en los Programas de transformación.



El diagrama de arriba presenta una ilustración de alto nivel del Mapa de la ruta de recuperación y transformación de LUMA, con programas organizados por su objetivo clave principal (aunque la mayoría de los programas tienen varios beneficios).



LUMA Annual Budgets

Fiscal Years 2023 to 2025

Who We Are – Our Values

Built for
Invested in
Listening to Puerto Rico

LUMA and our more than 3,000 co-workers are working hard every day to build a more reliable, more resilient, more customer-focused and cleaner energy system for the 3.2 million friends, family and neighbors who we are privileged to serve. We are committed to making infrastructure improvements every day and building the next-generation electric grid that Puerto Ricans expect and deserve.





Our Mission for Puerto Rico

To recover and transform the utility to deliver reliable, resilient and cleaner electricity.

KEY GOALS

PRIORITIZE SAFETY

Reform utility activities to support a strong safety culture focused on employee safety and the safety of the people of Puerto Rico

IMPROVE CUSTOMER SATISFACTION

Transform utility operations to deliver a positive customer experience and reliable electricity at reasonable prices

SYSTEM REBUILD & RESILIENCY

Effectively deploy federal funding to restore the grid and improve the resilience of vulnerable infrastructure

OPERATIONAL EXCELLENCE

Enable employees to pursue operational excellence through new systems, processes and training

SUSTAINABLE ENERGY TRANSFORMATION

Modernize the grid and the utility to enable the sustainable energy transformation

Executive Summary

Our proposed budget for July 2022 through June 2023 will enable LUMA's more than 3,000 hard-working men and women to continue to build a more reliable, more resilient and more customer-focused and cleaner energy system for our customers and all of Puerto Rico – without increasing the base rate that would raise customer bills.

We are sensitive to the importance of affordability, and to the significant spike in generation fuel costs that have resulted in higher rates – rate increases that are beyond LUMA's control.

TO BE CLEAR, WE DO NOT:

- Generate energy
- Control the impact that fuel costs have on customer rates

But we do manage costs associated with operation of the Transmission and Distribution grid and whether to request an increase in the base rate.

As outlined in our Annual Budget for Fiscal Year 2023 LUMA does not request an increase to customers rates related to LUMA's operation of the T&D system.

LUMA budget proposal

No Increase in Base Rate

Key Priorities

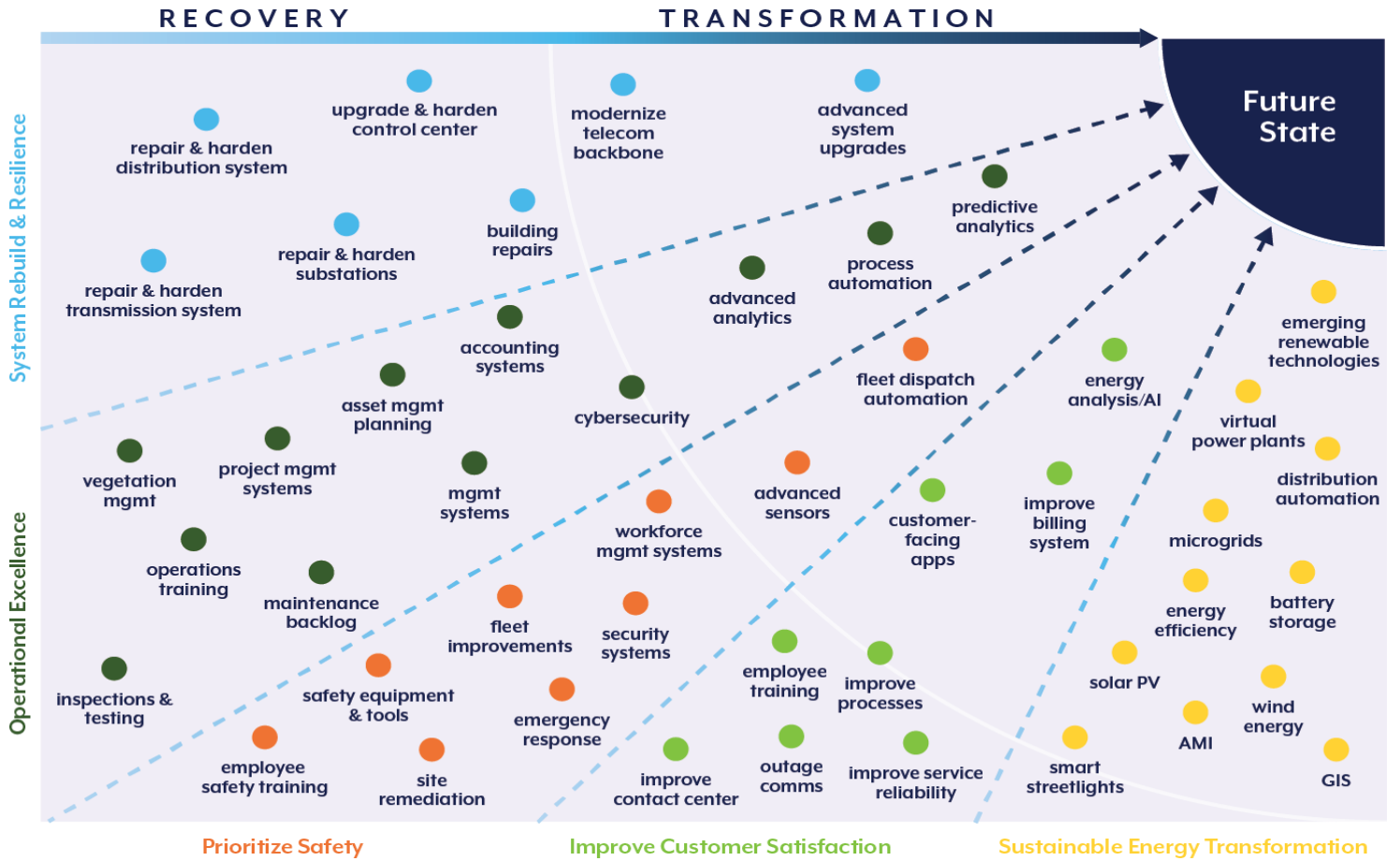
Without raising rates, we will continue to focus on annual system recovery and resiliency programs that will establish the foundation required to continue to empower the electric transformation across Puerto Rico.

- REPAIRING AND REPLACING POLES, STREETLIGHTS AND SUBSTATIONS
- IMPROVING CUSTOMER EXPERIENCE
- INCREASING VEGETATION MANAGEMENT
- ADVANCING STORM SEASON PREPAREDNESS
- INVESTING IN WORKER SAFETY AND TRAINING
- ADVANCING RENEWABLE ENERGY
- UTILIZING NEW TECHNOLOGIES FOR PUERTO RICO



Recovery and Transformation Framework

LUMA continues to prioritize the improvement programs using goals set forth by Puerto Rico public energy policy and summarized in the Recovery and Transformation Framework to ensure that the right changes are made at the right time to deliver value to our customers and meet legal, regulatory and contractual requirements. LUMA's investment plan is characterized by a near-term emphasis on foundational Recovery programs to improve both infrastructure and organizational health, while paving the way for an increasing focus on Transformation programs.



The diagram above presents a high-level illustration of LUMA's Recovery and Transformation Roadmap with Programs organized by their primary Key Goal (though most programs have multiple benefits).

Annual Budgets

Fiscal Years 2023 to 2025

July 13, 2022

Executive Summary

The Annual Budgets for Fiscal Year 2023 contained herein are presented pursuant to the Transmission and Distribution System Operation and Maintenance Agreement (T&D OMA) executed by the Puerto Rico Electric Power Authority (PREPA), the Puerto Rico Public-Private Partnerships Authority (P3A), LUMA Energy and its subsidiary LUMA Energy ServCo, LLC (LUMA) and dated as of June 22, 2020.

NO INCREASE IN CUSTOMERS RATES RELATED TO T&D OPERATIONS IN FY2023

LUMA understands the enormous privilege that our team of over 3000 men and women have to repair, rebuild, and restore the electric system for the people of Puerto Rico. Since taking over operations on June 1st, we have confronted an array of challenges that were the result of years – if not decades – of operational neglect. In spite of these challenges, we have not lost focus of the importance of building an electric system that is more customer-centric, reliable, and resilient, and empowers the growth of renewable energy. As part of customer focus, we have been sensitive to affordability, and to the significant spike in generation fuel costs that have resulted in higher rates – rate increases that are beyond LUMA's control. The cost of fuel and energy purchases from PREPA and other generators already make up more than 70% of our customers' bills. Global events, including the pandemic, global supply disruptions and the recent invasion of Ukraine by Russia, are having a significant and ongoing impact on the fuel costs portion of customer bills.

While LUMA does not generate energy, nor control the impact that fuels costs have on customer rates, we do manage costs associated with operation of the Transmission and Distribution (T&D) system. As part of our commitment to our customers and acknowledging the importance of operating as efficiently as possible, **LUMA does not propose any increase or any change in the base rate for Fiscal Year 2023.**

LUMA acknowledges that there remains significant work to address the many legacy challenges inherited from the past operator, and we believe it is important to recognize the substantial and numerous advances we have made that improve the reliability and resilience of the grid and the delivery of electric service. We are executing our plans while maintaining costs within limits so to maintain the same base rate to our more than 1.5 million customers.

The Annual Budgets are comprised of the Operating Budget, the Capital Budgets, and the Generation Budget – in each case, for the next year of LUMA's operations and projected budgets for the following two years. Fiscal Year 2023 consists of $547 million for Transmission & Distribution (T&D) operating expenses and $661 million in capital expenditures for the T&D System (including federal funding of $581 million and non-federal funding of $80 million). The remainder of the budget is composed of a Generation Budget and other expenses of $580 million.

KEY BUDGET PRIORTIES AND INVESTMENTS

The activities contemplated within the Fiscal Year 2023 budget are consistent with and advance the activities proposed within LUMA's Initial Budgets and approved by the Energy Bureau on May 31, 2021 and 2022 Fiscal Plan certified by FOMB on June 28, 2022 The proposed budget for Fiscal Year 2023 will enable LUMA's more than 3,000 hard-working men and women to continue to build a more reliable, more resilient and more customer-focused and cleaner energy system for our customers and all of Puerto Rico **– without raising T&D base rates that would raise customer bills.** Despite the Commonwealth of Puerto Rico's emergence from bankruptcy earlier this year, projected overall macroeconomic and electric

Annual Budgets

demand trends as well as PREPA's continued status in Title III bankruptcy protection result in projected overall lower revenues from the base rate available for T&D and Generation operating expenditures and other system costs.

With respect to key priorities and investments, over half of LUMA's annual program spending will be related to system recovery and resilience[1] programs to empower the electric transformation across Puerto Rico. Key investments include:

- **Repairing and Replacing Poles, Streetlights, Feeders and Substations:** In Fiscal Year 2023 LUMA's construction efforts will continue to be focused on pole replacements, streetlight repairs, rebuilding distribution feeders and substation repairs and rebuilds. This includes federally funded activities within transmission, distribution and substation repairs and replacements programs
- **Improving Customer Experience:** Continued investment in customer experience training and improved process resulting in response accuracy, clear communication, and shortened resolution times. Resources will be invested in reducing system limitations and manual work arounds and developing enhancements within the billing system for more accurate customer billing and improved revenue collection
- **Strengthening Vegetation Management:** Increased programmatic activities on vegetation management focused on improving reliability. As we advance our data driven Vegetation Management Plan (VMP), LUMA is bringing specialized equipment to Puerto Rico to continue the work of remediating rights-of-way and proactively removing vegetation in addition to outage response vegetation management
- **Enabling and Integrating Renewable Energy:** We are supporting the integration of over 800 MW of new utility scale solar from the PREB-approved RFP process, and coordinating the expansion of existing utility scale wind and solar facilities to add 175 MW in the near term. LUMA is developing the next IRP and collaborating with the DOE's PR100 initiative as well as starting and continuing to delivering IRP programs, projects and services that support the clean energy transition including net energy metering, energy efficiency, demand response (DR), and electric vehicles. Further, LUMA will be using advanced planning studies to optimize existing resources and identify where new generation and storage will improve resiliency at lower costs
- **Investing in Worker Safety and Training:** Continued near-term investments in operational excellence and safety programs related to technical training, tools and safety equipment, cybersecurity, T&D fleet repairs/replacements and security systems — collectively viewed as enabling programs necessary to establish the necessary organizational infrastructure to successfully and safely execute operational and capital work
- **Utilizing New Technologies in Puerto Rico:** LUMA will continue to invest in new and emerging technologies in Puerto Rico and broaden deployment to efficiently facilitate the recovery and transformation of the T&D System. Examples include the use of LIDAR to better understand and plan for right-of-way vegetation clearing, installation of advanced metering and monitoring systems, implementing new communication protocols, and enabling distribution automation to improve power quality and reliability, reduce losses and increase hosting capacity for distributed renewables

[1] LUMA defines resilience as the ability to limit the extent, severity, and duration of system degradation following an extreme event which has low frequency of occurrence but with significant consequences.

- **Advancing Emergency Preparedness:** While LUMA has already made significant foundational improvements to the T&D System within its first year of operations, with each passing year LUMA is sharpening preparedness and restoration for potential storms and other emergencies. We are continually improving plans, broadening training, and strengthening coordination with relevant agencies and communication with customers

The Annual Budgets represent substantial progress toward implementing improvement programs while also reflecting the time it takes build foundational organizational elements to increase the organization's capacity. These activities include continuing to advance LUMA's System Remediation Plan approved by the Energy Bureau to raise several aspects of the electric system and organization to the minimum industry standards. The projections provided for fiscal years 2024 and 2025 and beyond reflect the year-over-year improvements in the organizations capacity to deliver sustainable progress to modernize utility operations in Puerto Rico.

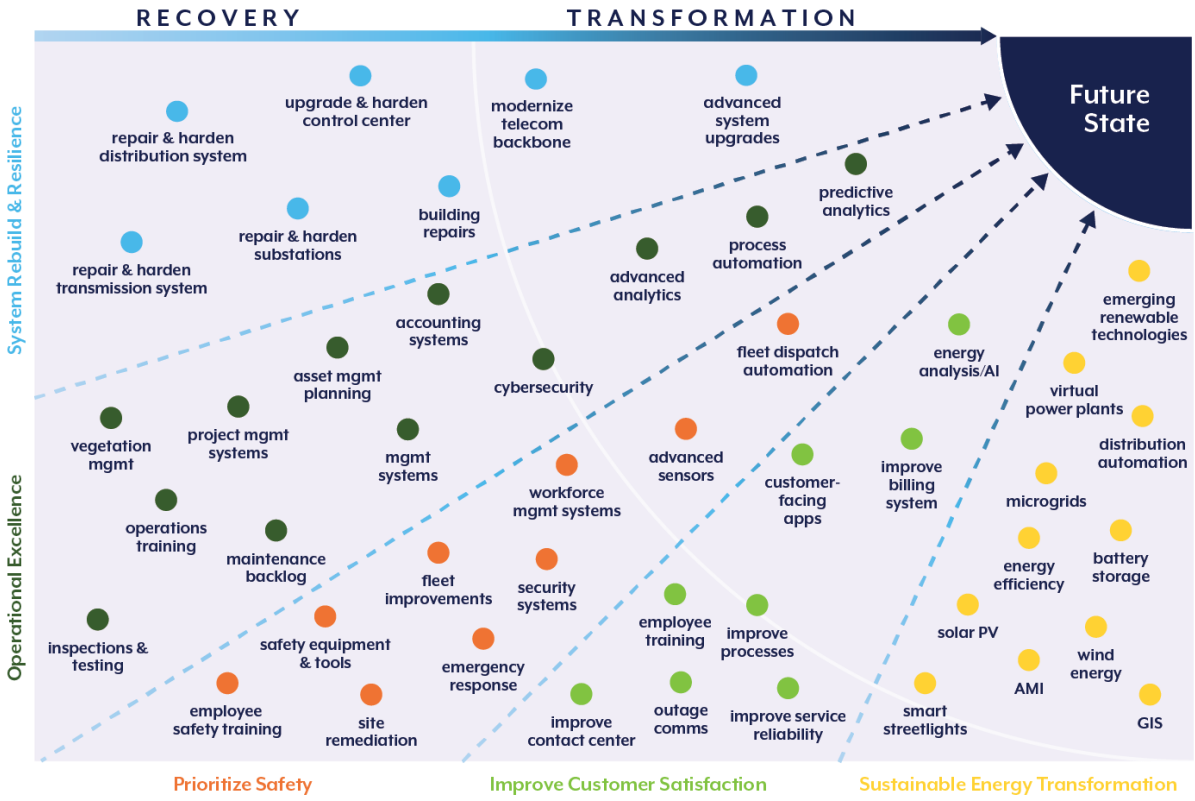
RECOVERY AND TRANSFORMATION FRAMEWORK

LUMA continues to prioritize the improvement programs using goals established by Puerto Rico public energy policy and summarized in the Recovery and Transformation Framework (below) to ensure that the right changes are made at the right time to deliver value to our customers and meet legal, regulatory and contractual requirements.



The result of the above is the Recovery and Transformation programs designed to deliver value to customers in accordance with policy and contract requirements. LUMA's investment plan is characterized by a near-term emphasis on foundational Recovery programs within Title III constraints to improve both infrastructure and organizational health, while paving the way for an increasing focus on Transformation programs. Below presents a high-level illustration of LUMA's Recovery and Transformation Roadmap. The diagram depicts LUMA's key Recovery and Transformation Programs, organized by their primary Key Goal (though most programs have multiple benefits).

Annual Budgets



SOURCES AND ASSUMPTIONS

LUMA's source information and assumptions for its budget and forecast are based on information at the time of filing. The Annual Budgets represent LUMA's judgment of reasonable forecast costs to deliver electricity to the people of Puerto Rico by carrying out the operational and capital work as outlined for fiscal years 2023 – 2025 and, consistent with the T&D OMA, consists of a budget for Fiscal Year 2023, and projections for fiscal years 2024 and 2025.

The Annual Budgets comply with PREB's Resolution and Orders in Case CEPR-AP-2015-0001 dated March 31, 2017 (2017 Rate Order) and Case NEPR-MI-2021-0004 dated July 16, 2021, and the T&D OMA. Namely, the Annual Budgets are within the base rate approved by PREB and implement methodologies consistent with riders associated with the 2017 Rate Order.

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List of Acronyms

Acronym	Definition
AAFAF	Puerto Rico Fiscal Agency and Financial Advisory Authority (Spanish acronym)
AC	Alternating Current
AC/DC	Alternating Current / Direct Current
AD&D	Accidental Death and Dismemberment
ADA	Americans with Disabilities Act of 1990
ADMS	Advanced Distribution Management Systems
AED	Atomated External Defibrillator
AGC	Automated Generation Control
AI	Artificial Intelligence
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
ANSI	American National Standards Institute
BES	Bulk Electric System
BP&D	Bill Print & Delivery
C&I	Commercial and Industrial
CAIDI	Customer Average Interruption Duration Index
CAPEX	Capital Expenditures
CBM	Component Business Model
CBS	Cost Breakdown Structure
CC&B	Customer Care and Billing
CCMO	Construction and Commissioning Management Office
CCTV	Closed-Circuit Television
CDBG-DR	Community Development Block Grant Disaster Recovery
CDC	Centers of Disease Control
CFR	Code of Federal Regulations
CFS	Cybersecurity Framework
CIA	Confidentiality, Integrity, Availability
CMMS	Computerized Maintenance Management System
CILT	Contribution in Lieu of Taxes
COR3	Central Office for Recovery, Reconstruction and Resiliency
CPG	Comprehensive Preparedness Guide

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CSAT	Customer Satisfaction
CSP	Puerto Rico Commission on Public Safety
CVR	Conservation Voltage Reduction
DC	Direct Current
DCD	Design Control Document
DER	Distributed Energy Resources
DG	Distributed Generation
DGA	Dissolved Gas Analysis
DOL	United States Department of Labor
DR	Demand Response
DSO	Day Sales Outstanding
DWDM	Dense Wave Division Multiplexing
EA	Enterprise Architecture
EAP	Employee Assistance Program
EBS	Oracle E-Business Suite
EE	Energy Efficiency
EMAP	Emergency Management Accreditation Program
EMS	Energy Management System
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPC	Engineering, Procurement and Construction
ERIS	Equipment Reliability Information System
ERM	Enterprise Risk Management
ERP	Emergency Response Plan
ESS	Energy Storage System
ETR	Estimated Time of Restoration
EVA	Earned Value Analysis
FAASt	FEMA Accelerated Awards Strategy
FAT	Factory Acceptance Test
FCR	First Contact Resolution
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FET	Front-End Transition
FLISR	Fault Location, Isolation, and Service Restoration

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FMCSA	Federal Motor Carrier Safety Administration
FMIS	Fleet Management Information System
FNSS	Functional Needs Support Services
FOMB	Federal Oversight and Management Board
FRC	Fire Retardant Clothing
FTE	Full Time Employee
FY	Fiscal Year
GenCo	Generation Company
GIS	Geospatial Information System or Gas Insulated Switchgear
GP&E	General Plan and Elevation
GPS	Global Positioning System
GridCo	Grid Company
HCM	Human Capital Management
HoldCo	Holding Company
HPS	High-Pressure Sodium
HR	Human Resources
HRIS	Human Resources Information System
HSE	Health, Safety and Environment
HSEQ	Health, Safety, Environment and Quality
HSPD	Homeland Security Presidential Directive
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning
IAM	Identity and Access Management
IBM	International Business Machines
ICEE	ICEE Metering Solutions
ICS	Incident Command System
IEEE	Institute of Electrical and Electronics Engineers
IEM	Innovative Energy Management
IMS	Inventory Management System
IP	Internet Protocol
IPP	Independent Power Producer
IRP	Integrated Resource Plan
ISO	International Organization for Standardization
IT	Information Technology

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IT OT	Information Technology/ Operational Technology
ITP	Inspection and Test Plan
ITSM	Information Technology Service Management
IVR	Interactive Voice Response
KPI	Key Performance Indicators
LED	Light Emitting Diode
LMR	Land Mobile Radio
LMVS	Locational Marginal Value Study
LTD	Long-Term Disability
MAM	Mobile Application Management
MDM	Meter Data Management
MFA	Multifactor Authentication
MSSP	Managed Security Service Provider
NDRF	National Disaster Recovery Framework
NERC	North American Electric Reliability Corporation
NERC-CIP	North American Electric Reliability Corporation - Critical Infrastructure Protection
NESC	National Electrical Safety Code
NIMS	National Incident Management System
NIST	National Institute of Standards and Technology
NME	Necessary Maintenance Expenditure
NPG	National Preparedness Goal
NRF	National Response Framework
NTLs	Non-Technical Losses
O&M	Operations and Maintenance
OEMBC	Office of Emergency Management and Business Continuity
OMS	Outage Management System
OPEX	Operating Expenditures
OPGW	Optical Ground Wire
OSHA	Occupational Safety and Health Administration
OT	Operational Technology
P3A	Puerto Rico Public-Private Partnerships Authority
PAM	Privileged Access Management
PBX	Private Branch Exchange
PCI	Payment Card Industry

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PI	Plant information
P&C	Protection and Control
PKEMRA	Post-Katrina Emergency Management Reform Act
PLC	Programmable Logic Controller
PMI	Project Management Institute
PMO	Project Management Office
PoC	Proof of Concept
PPD	Presidential Policy Directive
PPE	Personal Protective Equipment
PPOA	Power Purchasing and Operating Agreements
PREB	Puerto Rico Energy Bureau
PREPA	Puerto Rico Electric Power Authority
PROMESA	Puerto Rico Oversight, Management, and Economic Stability Act
PUP	Prudent Utility Practice
PV	Photovoltaic
QA	Quality Assurance
QC	Quality Control
RACI	Responsible, Accountable Contributor Informed
RAS	Remedial Action Schemes
RFP	Request for Proposals
RFQ	Request for Qualifications
ROW	Right of Way
RPO	Recovery Point Objective
RTO	Recovery Time Objective
RTU	Remote Terminal Units
S&L	Sargent and Lundy
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SIEM	Security Information and Event Management
SLA	Service Level Agreement
SLD	Single Line Diagram
SME	Subject Matter Expert
SONET	Synchronous Optical Networking

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SOP	System Operation Principles
SOW	Scope of Work
SRIA	Sandy Recovery Improvement Act
SRP	System Remediation Plan
SSO	Single Sign On
STD	Short-Term Disability
T&D	Transmission and Distribution
T&D OMA	Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement
TBD	To Be Determined
TDM	Time Domain Multiplexing
T&G	Transmission and Generation
TOU	Time of Use
TWACS	Two-Way Automatic Communication System
US	United States
USACE	United State Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	US Department of Transportation
UT	Utility Transformation
VAR	Volt-Amps Reactive
VM	Vegetation Management
VMP	Vegetation Management Plan
VoC	Voice of the Customer
VoIP	Voice Over IP
VPP	Virtual Power Plants
VVO	Volt VAR Regulation/Optimization
WBS	Work Breakdown Structures
WMS	Work Order Management System

1.0 Foreword

This document presents LUMA's Fiscal Year 2023 budget for the Puerto Rico T&D System. During the first ten months of operations, LUMA's team of more than 3,000 workers – many of whom work under hazardous conditions to upgrade and rebuild Puerto Rico's energy infrastructure– have shown our determination to build a customer-centric, reliable, resilient and safe utility. During the last ten months, LUMA has also supported Puerto Rico's advancement of public policies to transform the electricity grid into a flexible, modern, smart grid platform leveraging renewable energy resources.

LUMA'S FRONT-END TRANSITION

With decades of neglect and mismanagement compounded by damages from Hurricanes Irma and Maria in 2017, and earthquakes in late 2019 and early 2020, when LUMA began operations in June 2021 physical assets were in very poor condition. The inadequate maintenance and subsequent storm damage have had corresponding effects on system performance and reliability. Additionally, systems, processes and procedures were either non-existent or highly deficient, and nearly all organizational systems and processes required substantial changes or complete replacement to enable more systematic, standardized, and cost-effective deployment of resources and capital.

As part of the Initial Budgets submitted to the Energy Bureau in February 2021, LUMA detailed the findings from its assessments of PREPA's assets and operations carried during the first five months of Front-End Transition (FET). These findings revealed infrastructure and organizational systems that were in significant need of improvement and were the basis for LUMA's Fiscal Year 2022 budget. Within the filings LUMA set forth a plan to stabilize the system and start the initial and foundational activities to advance the goals and mission set forth for the T&D System.

LUMA's Initial Budgets, for fiscal years 2022, 2023 and 2024 and System Remediation Plan were approved by the Energy Bureau on May 31, 2021 and June 23, 2021, respectively.

START OF LUMA OPERATIONS

On June 1, 2021, LUMA assumed operational control and went to work to stabilize the T&D System. This included around-the-clock management at the control center, rolling fleet in the early hours of June 1st, 2021 and gaining access (for the first time) to many organizational systems.

Since starting operations on June 1, 2021, LUMA has continued to discover unexpected deficiencies that were not uncovered during the FET period due to PREPA's lack of cooperation and omissions. The extent of these deficiencies across the T&D System and in the inherited systems and processes resulted in adjustments to planned activities for Fiscal Year 2022 and subsequently planned activities for Fiscal Year 2023. Certain discovered deficiencies have been summarized in the first two quarterly reports and include the following:

- Non-functioning electrical assets and equipment including 29 non-functioning substations
- Broad and significant call center and Customer Care & Billing limitations
- Marginally operable Outage Management System (OMS)
- Isolated and inaccurate Asset Management (AM) system with incomplete upgrades at commencement
- Lack of documented current processes and procedures

- Critically insufficient technical and safety training of employees
- Lack of recent and relevant operational and industry standard training
- Lack of asset information, inaccurate system models
- Non-standard configuration, segregation, manual overrides and out of date operating Information Technology and Operational Technology (IT OT) systems, causing instability and weakness that directly impact service and reporting

In addition, progress on Federal Funding activities has been impacted by PREPA's inaction on preliminary planning and engineering during the first five months of 2021 in advance of LUMA's June 2021 commencement date. Additionally, establishing federal funding processes and concepts that are new to FEMA requires careful deliberation and on-going collaboration between Central Office for Recovery, Reconstruction and Resiliency (COR3), FEMA and LUMA to navigate the complexities of the T&D work being undertaken.

The deficiencies identified since June 1st, 2021, combined with those assessed during the FET, cause serious company-wide operational setbacks well beyond reasonable expectations. To help improve the overall energy system and practices that are crucial to building a world-class utility in Puerto Rico, LUMA has successfully started to address many of these obstacles. This includes providing significant training for its employees, starting the monumental task of stabilizing systems, improving safety, unwinding system customizations and manual workarounds, building foundational and instrumental processes and models and establishing the proper processes and controls required for federal funding and prudent utility operation.

This was not the way that we had anticipated starting LUMA operations. Through concerted and intensive effort and application of resources, LUMA has made substantial and qualitative progress towards stabilizing the T&D System. Nevertheless, these obstacles are materially impacting our operations throughout the Fiscal Year 2022 and materially impact LUMA's Annual Budgets for fiscal years 2023 through 2025.

2.0 Annual Budgets Overview

2.1 Purpose, Scope and Process

2.1.1 Purpose

LUMA is focused on the recovery and transformation of electric utility service to usher in a clean and resilient energy future for the people of Puerto Rico. As LUMA's application will support, there continues to be a significant amount of work necessary for recovery and transformation of the T&D System. A successful effort will require multiple years of focused execution. LUMA is also attentive to the goals established for the sector, including reasonable current customer rates. LUMA's proposed Annual Budgets are compliant with the calculations, methodologies and limits set forth in the 2017 Rate Order, specifically the base rate revenue requirement and riders set by PREB in that case. **Therefore, LUMA submits that this budget as proposed requires no base rate increase.**

LUMA's Annual Budgets are guided by its mission for the T&D System to recover and transform the utility to deliver customer-centric, reliable, resilient, safe, sustainable electricity at reasonable prices. LUMA's Annual Budgets were developed through a coordinated strategic planning approach to underpin a

balance of investment across many different initiatives, investments and activities required to meet the Recovery and Transformation Mission and Goals for the T&D System. This approach is a continuation of the strategic planning developed, Energy Bureau approved, and FOMB certified within LUMA's Initial Budgets. Please refer to Section 2.1.3 for further information on LUMA's Recovery and Transformation Framework.

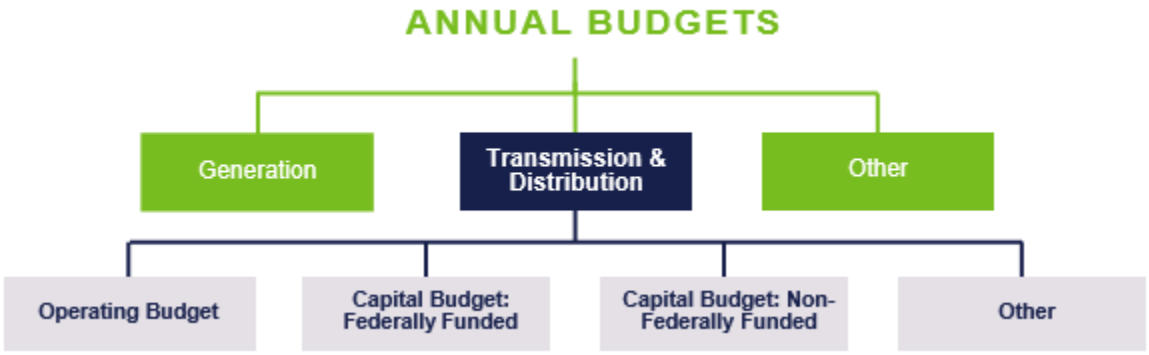
2.1.2 Scope

In compliance with Section 1.1 of the T&D OMA, the Annual Budgets consist of:

- The next fiscal year of LUMA's operations (year ended June 30, 2023), and projected budget for the following two years (years ended June 30, 2024, and 2025); and
- Operating Budget and Capital Budget (Federally Funded and Non-Federally Funded) for Transmission & Distribution and Generation Budget (please refer to Appendix D Generation Budget for further information)

A graphical illustration of components within LUMA's Annual Budgets is shown below.

Figure 2-1. Components of LUMA's Annual Budgets structure



To provide additional clarity as to how plans and initiatives fit within the Capital and Operating Budgets, including the overlap with federal and non-federal funding, please refer to the graphic below.

Figure 2-2. Capital Budget (*left*) and Operating Budget (*right*)



*Area of boxes not indicative of budget amount

LUMA's Annual Budgets includes the culmination of all activities, including day-to-day operating activities as well as items within the System Remediation Plan (SRP), Performance Metrics and System

Operations Principles (SOP), during the next three years of LUMA operations. Please refer to Schedule 5.4 for a summary of Investment Portfolios.

Please refer to Schedules included in Section 5, Key Assumptions and Basis of Forecast within Section 2.2, for further information.

2.1.3 Recovery and Transformation Framework

Consistent with LUMA's Initial Budgets submission, LUMA's approach within Annual Budgets to improve the T&D System and organization is grounded in our Recovery and Transformation Framework for the T&D System. The Framework establishes a link from Puerto Rico's key policy drivers to LUMA's project execution plans detailed herein. Fundamental to the Framework are LUMA's Mission and Key Goals for the T&D System shown in Figure 2-3 below. LUMA's Recovery and Transformation Framework, and the associated missions and goals remain unchanged from LUMA's approved Initial Budgets filing.

Figure 2-3. LUMA's Recovery & Transformation Mission and Goals

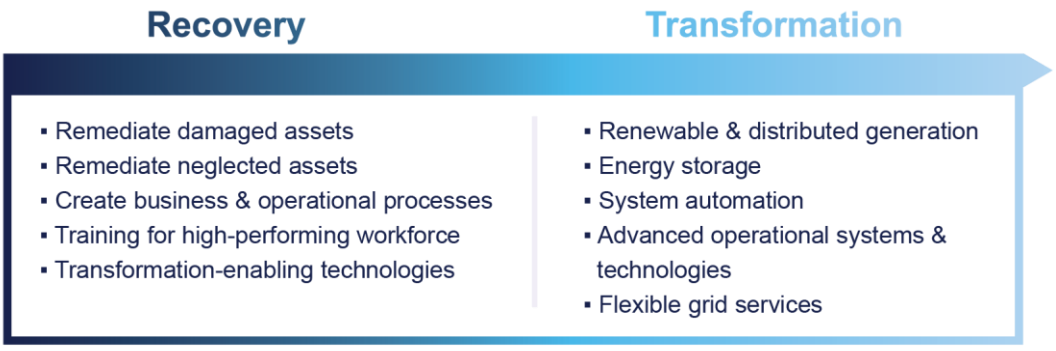


RECOVERY AND TRANSFORMATION PHASES

When considering the Key Goals noted above, it is important to keep in mind that all work contemplated and planned by LUMA has two phases: recovery and transformation, as shown in Figure 2-4 LUMA's planned activities for the coming years will focus on both phases.

Annual Budgets

Figure 2-4. Recovery & Transformation Phases



- The Recovery phase focuses on the restoration of the infrastructure and processes to a well-functioning state. This work has begun and involves completing stabilizing and foundational investments over the next several years to repair the grid, unwinding historic system limitations, fully implementing new processes, systems, and providing crucial training to enable LUMA to more effectively manage fundamental utility operations
- As the utility recovers, LUMA will accelerate the pace of transformation by further training employees on the knowledge, skills, and abilities necessary to manage advanced technologies and systems. In the Transformation phase, LUMA will be redesigned to meet Puerto Rico's energy policies and needs for the coming decades. This phase will accelerate the transition to greater reliance, and eventually full reliance on renewable generation and distributed energy resources, made possible through advanced operational systems and technologies designed for the utility of the future

It should be noted that Recovery and Transformation are not separate, sequential phases as many Transformation programs are beginning alongside and in coordination with Recovery programs.

RECOVERY AND TRANSFORMATION ROADMAP AND INHERHITED CONDITIONS

LUMA's resulting investments from the Recovery and Transformation Framework included in this Annual Budgets has been established based on the inherited conditions, emerging global factors, and substantive learnings from LUMA's first nine months of operations including:

- **FEMA progress** was in essence nonexistent prior to LUMA, and a complete reset was required to establish basic process understanding with FEMA. The most notable fundamental process has been creating an acceptable approach to dealing with 406 Hazard Mitigation Grant Program (406HMGP) funding. The 406HMGP is critical funding to supplement Permanent Assistance funding to enhance the resiliency of the T&D System. The basic principles for the applicability of 406HMGP were not contemplated under the Puerto Rico 428 Public Assistance FEMA Accelerated Awards Strategy (FAASt) process, wherein damage assessments from Hurricane Maria were not conducted on the entire system, but rather extrapolated to establish the $10.7 billion of obligated funding. Without detailed damage assessments, establishing an acceptable approach to 406HMGP funding has been and will continue to be challenging.
- **World markets** have changed in terms of accessibility and timing of materials. As a result of the pandemic and associated supply chain constraints, and most recently the Russian invasion of Ukraine, costs, and lead times for delivery of electrical and other equipment have significantly increased. Manufacturers and suppliers have extended lead times on many times to 20-52 weeks. These

extended lead times along with inflation will materially impact LUMA's ability to receive delivery of materials on island.

- **State of PREPA.** While LUMA expressed concerns with the state of PREPA in its Initial Budgets submission, upon taking over operations in June 2021 it became evident that the state of the T&D System, including planning, modeling, standards and drawings, and all associated systems (e.g., IT OT, customer care and billing, financial, etc.) were in even worse condition than expected, as discussed within Section 1.0 above. The effort to recover and stabilize has begun and will continue several years as described in this Annual Budgets submission.
- **PREPA's Title III Exit and reorganization.** The Government of Puerto Rico and the FOMB have stated that they expect PREPA to conclude its reorganization and exit Title III during Fiscal Year 2023. LUMA may be required to perform additional work to support PREPA's separation into separate companies and provide information to the FOMB in support of its negotiations with PREPA's bondholders. While these activities are not included within the budgets, they do require time and resources from LUMA.

The development of the capital work proposed within the Annual Budgets presented herein incorporated multiple factors:

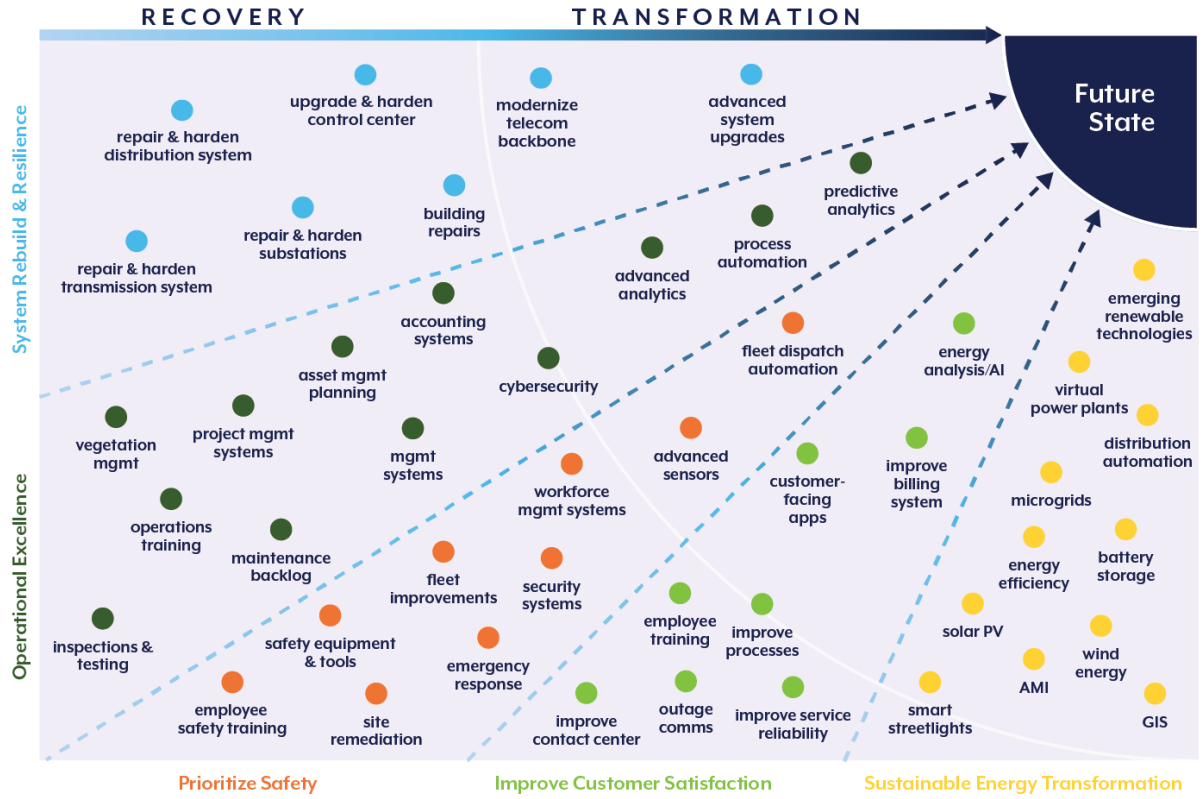
- The learnings noted above
- The PREB-approved federally funded activities consisting of $7.8 billion in projects/programs within Docket NEPR-MI-2021-0002
- General consideration and approach for the following three years of work as follows:
  - Fiscal Year 2023: Develop models, accumulate necessary data, establish necessary standards, undertake planning and engineering activities; and undertake straightforward projects
  - Fiscal Year 2024: Continue planning and engineering activities and ramp-up with straightforward to moderately complex projects
  - Fiscal Year 2025: Ongoing planning and engineering activities; and execution of more advanced projects

Timing and sequencing of PREB approved, federally funded projects as well as non-federally funded projects based on the following criteria:

- Asset criticality and impact to reliability
- Operational impacts and conflicts
- Construction durations
- Construction capacity limitations
- Procurement lead times

The result of the above is the Recovery and Transformation programs designed to deliver value to customers in accordance with policy and contract requirements, within Title III constraints. LUMA's investment plan is characterized by a near-term emphasis on foundational Recovery programs to improve both infrastructure and organizational health, while paving the way for an increasing focus on Transformation programs. Figure 2-5 below presents a high-level illustration of LUMA's Recovery and Transformation Roadmap. The diagram depicts LUMA's key Recovery and Transformation Programs, organized by their primary Key Goal (though most programs have multiple benefits). As noted earlier, the Recovery and Transformation are not distinct, sequential phases as many Transformation programs will begin alongside and in coordination with Recovery programs. A full list of these programs is provided in Program Briefs within Appendix C.

Figure 2-5. Recovery and Transformation Roadmap



2.1.4 Process

The Annual Budgets were developed consistently with LUMA's process and approach to LUMA's Initial Budgets, using a three-phase approach of assessment, analysis, and planning. Specifically, the Annual Budgets development comprised the following key activities:

DEVELOP METHODOLOGY AND TIMELINE

- Review of LUMA's approved Initial Budgets and SRP, PREPA Fiscal Plans, Rate Cases and relevant PREB Regulations and filing requirements
- Prepare Annual Budget process plan
- Development of systems to support budget process
- Identify applicable laws and regulations

FOUNDATIONAL ACTIVITIES

- Confirm understanding of filing process and required information for Annual Budgets filing
- Review at the account level Fiscal Year 2022 activities and the Energy Bureau's approved Initial Budgets to develop scope and criteria for budget templates
- Develop budget templates to assist LUMA Teams with budgeting process
- Review and refine templates with workstream teams

SUPPORT TEAM BUDGET DEVELOPMENT

- Teams use template recommendations and ensure reporting consistency across various teams
- Prioritization according to LUMA's Recovery and Transformation Framework
- Ensure alignment with Performance Metrics, and SRP
- Review of Annual Budgets draft compared to previous Initial Budgets, 2017 Rate Order and 2021 Fiscal Plan

ANNUAL BUDGET CONSOLIDATION

- Draft Annual Budgets for review
- Review of consistency with SRP and Performance Metrics
- Revise based on internal reviews and prepare final document

2.2 Key Assumptions and Basis of Annual Budgets

KEY ASSUMPTIONS AND BASIS OF ANNUAL BUDGETS

LUMA has compiled its estimates based on a bottom-up exercise, using an activity-based budgeting approach to support the next three years of the Puerto Rico electric Recovery and Transformation. Informed from LUMA's review of the 2017 Rate Order, this budgeting approach is limited to the approved Base Rate from the 2017 Rate Order. The forecasted load currently declines over the Budget period, and as such the funding available for LUMA's Budgets decreases with forecasted decreases in load. LUMA's Budgets include future efficiencies within its forecast for fiscal years 2024 and 2025. These future efficiencies generally account for the forecasted reduction in load and will be achieved through a combination of additional LUMA operational efficiencies and savings from LUMA's loss reduction program. For further information on the 2017 Rate Order limit, please refer to Schedule 5.6.

LUMA has developed its Annual Budgets on a modified accrual basis consistent with PREPA's historical presentation while under the Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA) Title III protection. Post-Service Commencement Date (as defined in the T&D OMA), and upon exit of Title III, PREPA's financial statements will be prepared based on applicable U.S. Generally Accepted Accounting Principles. The FY23 Budget will be mapped to applicable FERC accounts to support budget versus actual reporting.

LUMA has informed its estimates based on its first nine months of operation, including the multiple and varied challenges as discussed, previous experience and market estimates built on existing contracts.

Title III and Advisor related costs are based on estimates provided in the 2022 PREPA Fiscal Plan (as certified by the FOMB on June 28, 2022) and rely on the guidance provided by P3A, FOMB and PREPA. Estimates are based on the assumption that PREPA is expected to exit Title III by June 30, 2023. Title III and advisor costs are confirmed with P3A, FOMB and PREPA and consistent with amounts certified by the FOMB in the 2022 PREPA Fiscal Plan.

The 2023 budget forecast has been indexed to 2024 and 2025, except as indicated. Specifically, base assumptions include:

- Inflation: compounding for all T&D Pass Through Expenditures, with inflation consistent with macro-economic assumptions provided by the Puerto Rico Fiscal Agency and Financial Advisory Authority

("AAFAF", for its Spanish acronym) and FOMB on January 31, 2022, specifically 2.7%, 1.7%, and 1.6% for fiscal years 2023, 2024, 2025, respectively

- Salary and wages: LUMA's estimates are based on actual salaries, with relevant projected amounts for new personnel and adjustments for inflation.
- Benefits: LUMA's estimates of pension, healthcare and administrative costs are based on healthcare and other providers' costs incurred in the first nine months of LUMA operations

Annual Budgets include T&D Pass Through Expenditures as defined within the T&D OMA, and described in Section 2.1 Scope, above. Annual Budgets do not include LUMA activities related to items beyond T&D Pass Through Expenditures, such as supporting the Grid Company (GridCo) Generation Company (GenCo) Holding Company (HoldCo) Operating Agreement, additional requirements imposed by a Governmental Body after approval of the Annual Budgets as defined in the T&D OMA, large scale renewable interconnection studies and interconnection costs caused by new generators as well as support invoiced to Request for Proposals (RFP) proponents, the application process for distributed generation customer connection, large customer connections, energy efficiency and demand response incentive programs, and costs to advance electric vehicle deployment.

GenCo Shared Services (Shared Services) are defined in Article 1 of the T&D OMA as "certain administrative services that [LUMA] shall, on behalf of [PREPA], provide to GenCo in accordance with the terms and conditions of the Shared Services Agreement and Applicable Law" and are governed by the Shared Services Agreement (SSA) between PREPA, P3A and LUMA effective June 1, 2021. Estimated costs for Shared Services are included as part of the Generation Budget for all three fiscal years (2023 – 2025) and will be delivered at actual incurred cost with zero profit mark-up for LUMA. Please refer to Section 4.3 for further information on Shared Services provided by LUMA to GenCo.

The Program Briefs (please refer to Appendix C) from LUMA's approved Initial Budgets have been updated based on information known at the time of this Annual Budgets filing. The federally funded capital amounts provided are current estimates based on a reasonable judgement of the schedule of programs and projects that may be federally funded. All projects are subject to approval by the appropriate federal agency.

Within the Annual Budgets, LUMA has included the certified Generation Budget. The development of the Generation Budgets is outside the control of LUMA. Please find further discussion in Appendix D.

Several other items outside the control of LUMA include Title III, FOMB Advisor, P3A Transaction and PREPA HoldCo costs. These items are detailed in Schedule 5.3 Other.

The Annual Budgets are completed and informed based on a particular point in time. As such, they cannot reasonably contemplate information that may arise in the future or, if additional requirements are determined, are not already contemplated.

LOAD FORECASTS

The load forecast prepared by LUMA for this Annual Budgets filing is consistent with methodologies approved by the Energy Bureau within the 2017 Rate Order, Permanent Rate Docket NEPR-MI-2020-0001, and Initial Budgets Docket NEPR-MI-2021-0004, as well as recent fiscal plans, including the 2022 PREPA Fiscal Plan as certified by the FOMB on June 28, 2022. Forecasts were updated based on actual load data and macroeconomic factors received from AAFAF/FOMB in January 2022 and are consistent with the information supporting the 2022 PREPA Fiscal Plan. Specifically, the load forecast has been

compiled using the same process as the last fiscal plan and reflect the Modified Action Plan as approved by PREB on August 24, 2020, in the Final Resolution and Order on the Integrated Resource Plan (IRP) taking into consideration the subsequent delays in procurement of utility-scale renewable energy.

Specifically, the load forecast was developed consistently with the underlying forecast approved by the PREB with ongoing updates as required to the Fuel Adjustment Clause and Purchased Power Adjustment Clause within the Permanent Rate docket (Docket NEPR-MI-2020-0001). The projected sales included within Schedule 5.6 is consistent to the amounts certified by the FOMB within the 2022 PREPA Fiscal Plan.

To avoid duplication of efforts as well as to comply with the Energy Bureau's March 25, 2022 Resolution and Order clearly delineating correlation with the FOMB's Fiscal Plan process, LUMA is not providing the Fuel, Purchased Power, Contribution in Lieu of Taxes (CILT) and Subsidies forecasts.

Assumptions for the energy efficiency and demand response reductions begin in Fiscal Year 2023, in compliance with the Energy Bureau's revised Energy Efficiency regulation and its January 21, 2022 Resolution & Order (Docket NEPR-MI-2021-0002).

LUMA's current year methodology, including items such as the load forecast, relies on methods and practices currently in place. As discussed within the SOP (Docket NEPR-MI-2021-0001) LUMA's approach to load forecasting continues to be one of consistency and conservativeness given the available information. As discussed in the SOP technical conference on September 17, 2021, to develop a long-term load forecast correctly and enable quality future regulatory filing will take years.[2] Nevertheless, LUMA has commenced efforts towards improving the long term Load Forecast process, and is on track to meet the deadlines as outlined within LUMA's SOP filing.

During the period covered by the Annual Budgets LUMA will implement a Loss Recovery Program, to reduce losses within the system. Electrical losses are the difference of the energy generated (and injected into the power system) and the total energy billed. Electrical losses have two components: technical losses and non-technical losses (NTLs). Technical losses (sometimes called "line losses") are the energy lost due to physical losses on the T&D System. NTLs are energy that is delivered over the distribution system but that is not billed and includes theft of energy, energy delivered but not metered or estimated, and other energy that is consumed by customers but is not billed.

The magnitude of the losses will be revised as meter recording, billing and collection data are improved and as theft is detected and addressed. In addition, the accuracy of the amount of energy lost will be improved when more precise and accurate metering equipment is installed between the generation and the transmission & distribution system, and when older meters are replaced or calibrated.

PRIVATE OPERATOR COMPENSATION

LUMA has estimated its fee in compliance with the T&D OMA. The fee as set forth in the Supplemental Agreement for the period as of June 1, 2021 until PREPA's exit from Title III (defined as the 'Interim Period') is fixed, with fixed and variable components to be applied after PREPA's exit from Title III and Service Commencement Date (defined as the 'Initial Term'). LUMA provides the following Figure 2-6 below to graphically illustrate which period applies based on key milestones.

[2] NEPR-MI-2021-0001, September 13, 2021 Filing, Exhibit 1, Section 3.0 Load Forecasting Procedure

Annual Budgets

Figure 2-6. Defining Period



The division of LUMA's fee into fixed and variable components, the proportion between the two components, and the basis for the variable component being determined in accordance with the results of performance metrics were defined by the P3A Partnership Committee in accordance with the T&D OMA.. The Partnership Committee chose this structure in order to maintain public ownership of the T&D Assets, fulfill the requirements of a Qualified Management Agreement as defined by Internal Revenue Service rules and guidelines, maintain current and future eligibility for federal disaster relief funding, and avoid the need to raise consumer base rates. See Partnership Committee Report – Puerto Rico Public Private Partnership for the Transmission and Distribution System, May 15, 2020 (pp. 42-45).

Table 2-1 below provides details on LUMA's estimated fee within the Annual Budgets.

Table 2-1. LUMA Fee – Compliant with T&D OMA ($ million)

	FY2023	FY2024[4]	FY2025
Interim Period (12 months – July 1 to June 30, 2022)			
Interim Period Service Fee[1]	115		
Initial Term (Contract Years 1 and 2)			
Service Fee - Fixed		70	90
Service Fee - Variable[2]		13	17
LUMA Fees		**83**	**107**
Subtotal - prior to Inflation	**115**	**83**	**107**
Total - Including Inflation[3]	**122**	**93**	**123**

[1] As defined as Operator Compensation in the P3A May 15, 2020 Partnership Committee Report, PDF page 323.

[2] Provision with determination of performance target achievement and payout as per T&D OMA Section 7.1(c). If payout is lower LUMA proposes amounts to be returned to ratepayers through annual budget process.

[3] Inflation applied consistent with the T&D OMA (as defined by the 'CPI Factor'), or where not yet identified, consistent with assumptions from the macro-economic assumptions provided by AAFAF/FOMB on January 31, 2022, as noted above in Section 2.2.

[4] Assumes Contract Year 1 starts on July 1, 2023.

For further information on the Service Fees during the Interim Period and Operating & Maintenance (O&M) Services Period, please refer to Section 7.1 and Annex VIII of the T&D OMA, and Section 3.3. of the Supplemental Agreement.

2.3 Highlights and Proposed Schedule

2.3.1 Highlights

BUDGET SUMMARY

Compliant to the executed T&D OMA, please find a summary of the Annual Budgets, specifically the Operating Budget, Capital Budget (Federally and Non-Federally Funded), and the Generation Budget for fiscal years 2023 – 2025.

Table 2-2. Annual Budgets ($ million)

	Budget FY2023	Forecast FY2024	Forecast FY2025
Transmission & Distribution			
Operating Budget[1]	**547**	**480**	**410**
Capital Budget - Total	**661**	**1,046**	**1,353**
Capital Budget - Federally Funded	581	891	1,174
Capital Budget - Non-Federally Funded	80	155	178
Generation Budget[2]	**306**	**245**	**178**
Other	**275**	**273**	**288**
LUMA Fee	122	93	123
Bad Debts	74	96	90
Bankruptcy and Advisor Costs	50	63	55
PREPA HoldCo	29	20	21

[1] Operating Budget does not include Shared Services.

[2] PREPA's Certfied FY2023 Genco Budget, as certified on July 1, 2022 and submitted by PREPA to LUMA on July 6, 2022. Please refer to Appendix D. Generation Budget includes budgets for services at GenCo currently provided under the Shared Services Agreement of $59 million, $60 million, and $62 million for FY 2023-2025, respectively. Please refer to Section 4.3.

KEY ACTIVITIES

As contemplated within the Initial Budgets, LUMA will continue to manage and operate the T&D System and perform O&M Services. LUMA will continue its work to improve the system through the further development and implementation of policies, procedures and plans, as well as initiate and establish new emerging workstreams such as electric vehicles, support for the large scale renewable energy procurement processes and the next IRP. LUMA's combined activities will provide for the safe and

effective operation of the T&D System, while improving reliability and service to customers across Puerto Rico. Key activities in the next three years of operations include the following:

Operating

Operating Budgets, including T&D Pass-Through Expenditures are required to perform operation and maintenance services for the T&D System. LUMA plans to fulfill its ongoing requirements as the operator under the T&D OMA and continue to advance improvement programs which support the Recovery and Transformation Framework (refer to Section 2.1.3).

Specifically, department operation and maintenance activities include:

- **Customer experience department:** continue improving communication protocols and customer billing and collection practices that personify courtesy, capture efficiencies, and demonstrate proactivity.
- **Operations department:** focusing on providing ongoing safe and reliable services to customers and continuing to build on achievements from Fiscal Year 2022, creating the foundation to support the Recovery and Transformation through optimizing line and substations work as well as vegetation, fleet, and materials management.
- **Utility Transformation department:** providing the technical, engineering, planning and programmatic framework required to deliver safe and reliable service to its customers while maintaining focus on the long-term vision articulated in the IRP. Focusing on LUMA's commitment to renewable energy through continued work with customers on the interconnection of distributed generation (DG), optimal placement analyses of renewable and storage, developing area plans, development of the Phase I Electric Vehicle (EV) infrastructure plan and performing interconnection studies for the growth of large-scale renewables through Renewable Procurement Tranches 1-6 as well as the implementation of quick-start Energy Efficiency and Demand Response programs, as allowed by the Energy Bureau.
- **Support Services department:** facilitating utility operations with a safety-first culture, continued focus on training, development of an overall IT OT framework and optimizing systems, procedures and processes for functions including Finance, HR, Regulatory and Procurement.

Please refer to Section 4.1 for further information on key operation and maintenance activities by departments.

Capital

The Capital Budget comprises the Capital Budget – Federally Funded and the Capital Budget – Non-Federally Funded.

- **Capital Budget – Federally Funded**: Fiscal Year 2023 budget is predominantly focused on the distribution, transmission, substations portfolios as well as the control center and buildings.
- **Capital Budget – Non-Federally Funded:** LUMA plans to fulfill its ongoing requirements as the operator with a Fiscal Year 2023 focus within customer experience, distribution, substation and enabling portfolios.

Specifically, capital work includes the following portfolios:

- **Customer Experience portfolio:** The customer experience will continue to be enhanced in multiple ways. The streetlight repair program will continue to progress by assessing, planning, and executing repair work across the island. Streetlighting will be physically accounted for and updated with a unique

identifier tag. The Modernize Customer Service Technology program has reached remediated state, and this will enable our Customer Experience team to continue implementing improvements and allow us to continue to serve our customers better.

- **Transmission and Distribution portfolios**: T&D assets damaged by Hurricanes Irma and Maria that received temporary emergency repairs to quickly restore service will receive permanent repairs. Assets such as towers, poles, lines, anchors, and guywires will all be repaired, restored to current standards, and hardened to increase resiliency where possible. New technology and capital investments will automate distribution and increase transmission reliability. The telecommunication system will be restored and modernized as improvements continue to be made.
- **Substation portfolio:** Substations will be repaired, rebuilt, and made safer and more reliable, while increasing mitigation against future disasters. Physical security at substations will be improved through repairing fences and lighting, replacing padlocks, and installing new signage. Grounding of substations will be improved to safeguard public, LUMA personnel, and ensure proper equipment operation. Substation technologies will be upgraded to allow for fast, secure protection and control systems with advanced diagnostics, event reporting, and self-monitoring systems.
- **Control Center and Buildings portfolio:** Control centers, which are critical for the delivery of economic and reliable energy, will be refurbished or completely rebuilt. They will continue to receive critical software upgrades and new technical capabilities that allow for improved energy management and balancing the supply and the demand. New system operating procedures and strategies will be developed alongside the physical, software and technological upgrades. Buildings such as warehouses and mechanic shops will be remediated for damages by natural disasters, with security improved at facilities.
- **Enabling portfolio:** The Enabling portfolio establishes the necessary infrastructure and systems to enable the successful execution of operational and capital work. The portfolio of investment programs focuses on safety, technical training, and operational excellence. Investment programs include the ongoing provision of Personal Protective Equipment (PPE) and tools (as well as provisions for their inventory and management), training in skills and safety for all employees, continued enhancements to the Project Management Office (PMO) specifically designed to handle large capital projects and new data systems to accurately store and manage data on T&D assets gathered through assessments.
- **Support Services portfolio:** The Support Services portfolio is cross functional in nature and includes HR programs for attracting, training, and retaining a high-performing employee base through standardized processes for performance and talent management, succession planning, recruitment and onboarding, learning management and compensation. This portfolio also includes programs to support a public safety strategy, proper land management policies and procedures, cross-functional technology systems and the implementation of processes and tools to secure information resources while permitting appropriate access to authorized stakeholders through information systems that are prudently maintained.

Please refer to Program Briefs within Appendix C and Schedule 5.5 for Improvement Portfolios – Total Capital Expenditures (federally funded and non-federally funded) activities.

KEY OUTCOMES

As a result of activities included in the Annual Budgets, LUMA will provide the following key outcomes for the people of Puerto Rico.

Annual Budgets

Prioritize Safety

Investing significantly to prioritize safety, directly impacting the safety of employees and the people of Puerto Rico, notable outcomes include:

- Training: LUMA employees will have access to state-of-the-art training, facilitating the transition to a safety-first culture, allowing for consistent application of practices, and supporting execution of planning, construction, and operational activities more effectively
- Safety equipment and tools on worksites: facilitating the safe and effective completion of increased activities
- Improved work processes: providing consistent and more effective practices with a holistic strategic vision
- Decreasing safety incidents for both employees and the people of Puerto Rico with investments in safe sites with security
- Reducing public exposure to safety risks through the public safety and assessment programs along with specific investments such as street lighting and piloting an elementary school power safety program to be launched in Fiscal Year 2023

Improve Customer Satisfaction

Customers will continue to receive an improved customer experience and increased service reliability including:

- Improved billing accuracy and transparency
- Faster response and resolution times, with a reduction in customer effort
- More ways to connect and easier access through digital self-service options
- An improved overall customer interaction/experience with improved transparency of outage and restoration times
- Improved payment options and collection activities
- Driving for efficiencies in a holistic strategic approach to activities, additional opportunities for efficiencies will be determined through optimizing processes and materials with investments in operational excellence
- Infrastructure investment through energy loss reductions

System Rebuild and Resiliency

LUMA continues to remain focused on rebuilding and transforming the T&D System to improve its resiliency. LUMA will be facilitating the deployment of significant federal funding ($2.5 billion over three years) to advance this goal. Some activities in progress to help achieve this goal include:

- Coordinating and efficient targeting of the highest-risk infrastructure outlined within the System Remediation Plan (SRP)
- Reducing outages and improving reliability as outcomes from improved dispatch efficiency, improvements in transmission capacity, and replacement of damaged and/or assets in poor condition with more robust, modern assets, which also includes identifying and remediating flooded assets
- Improving street lighting that considers energy efficiency and environmental needs of specific areas, wildlife, and populations.
- Rebuilding transmission and distribution lines and substations to improve the security and resiliency of the grid. Undergrounding critical facilities (when necessary).

- Improving system design to bolster resiliency and redundancy by being N-1 compliant, which will include building a more resilient substation bus configuration, loop restoration, and adopting new standard enhancements.

Operational Excellence

Driving for operational excellence through systematic approaches to management, project delivery and business operations, as well as providing customers with an increased understanding of electric utility operations through:

- Implementation and training of policies and procedures developed as a holistic approach relying on industry experts and best practices resulting in:
  - Increased system reliability through continued improvements to the T&D system
  - Improved response times reducing outages and improving public and employee safety
  - Improved emergency response times due to utilization of Incident Command System principles and structures
- Transparent communication of data and records
- Accountability through reporting of metrics that will lead to continuous improvement

Sustainable Energy Transformation

Laying the groundwork, as well as incorporating solutions, for grid modernization, digital transformation, and renewable energy, including but not limited to the following.

- Providing technical support for renewable energy and battery storage procurement consistent with the IRP
- Engaging in PR100 activity pathways to help support Puerto Rico's renewable energy goals of 100% renewable energy by 2050
- Upgrading IT OT and cybersecurity capabilities enabling more efficient and automated operations
- Identifying cost-effective opportunities for using energy storage and distributed energy resources as resiliency, capacity deferral and flexibility solutions
- Planning for the delivery of demand response and energy efficiency programs
- Identifying requirements to enable Advanced Metering Infrastructure (AMI) and integrated data management systems, smart meters, and communication networks
- Implementing new an Energy Management System (EMS) and Supervisory Control and Data Acquisition (SCADA) architecture to enhance visibility of the grid and enhance decision making
- Leveraging the capabilities of smart inverters to help integrate solar energy and other distributed energy sources into the grid as a method to improve the quality of supply voltages and increase hosting capacity

3.0 Annual Budgets

3.1 Annual Budgets Expenditures

3.1.1 Annual Budgets Expenditures

The Annual Budgets and forecasts for fiscal years 2023 – 2025 are outlined in the table below. Please refer to Schedule 5.1 for further information.

Table 3-1. Annual Budgets – Budgets ($ million)

	Budget FY2023	Forecast FY2024	Forecast FY2025
Transmission & Distribution			
Operating Budget[1]	**547**	**480**	**410**
Capital Budget — Total	**661**	**1,046**	**1,353**
Capital Budget — Federally Funded	581	891	1,174
Capital Budget — Non-Federally Funded	80	155	178
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LUMA Fee	122	93	123
Bad Debts	74	96	90
Bankruptcy and Advisor Costs	50	63	55
PREPA Legacy	29	20	21

Notes:

[1] Operating Budget does not include Shared Services.

[2] PREPA's Certfied FY2023 Genco Budget, as certified on July 1, 2022 and submitted by PREPA to LUMA on July 6, 2022. Please refer to Appendix D. Generation Budget includes budgets for services at GenCo currently provided under the Shared Services Agreement of $59 million, $60 million, and $62 million for FY 2023-2025, respectively. Please refer to Section 4.3.

3.1.2 Comparison to Current Rate Order (2017)

The Annual Budgets are within the approved base rate revenue requirement limit as determined within the 2017 Rate Order. Please refer to Schedule 5.6 for further information. The table below presents a summary comparison to the approved 2017 Rate Order.

Table 3-2. Summary Comparison to Current Rate Order (2017) ($ million)

	Annual Budgets	Rate Order

Annual Budgets

	Budget FY2023	Forecast FY2024	Forecast FY2025	Approved Forecast FY2017
Forecasted Sales (GWh)	*16,510*	*16,212*	*15,222*	*17,268*
Transmission & Distribution	**627**	**636**	**588**	**923**
Operating Expenditures[1]	547	481	410	707
Non-Federally Funded Capital	80	155	178	216
Generation[2]	**306**	**245**	**178**	**267**
Other[3]	**275**	**273**	**288**	**99**
Total	**1,207**	**1,153**	**1,054**	**1,289**

Notes:

[1] Operating expenditures do not include Shared Services in annual budgets but include Shared Services activities in the rate order.

[2] LUMA has included PREPA's Certfied FY2023 Genco Budget, as certified on July 1, 2022 and submitted by PREPA to LUMA on July 6, 2022. Please refer to Appendix D. Generation Budget includes budgets for services at GenCo currently provided under the Shared Services Agreement of $59 million, $60 million, and $62 million for FY 2023-2025, respectively. Please refer to Section 4.3.

[3] Other includes Bad Debts, PREPA HoldCo, Bankruptcy and Advisor Costs, LUMA Fees and 2% Reserve for Excess Expenditures. Please refer to Schedules 5.1 and 5.3 for further information.

Key variances between the Annual Budgets and the 2017 Rate Order include:

- Load forecast in the 2017 Rate Order was approximately 17,300 GWh forecast as compared to 16,510 GWh, 16,212 GWh and 15,222 GWh forecast for FY2023, FY2024 and FY2025, respectively.
- The 2017 Rate Order did not include costs related to Title III and the private T&D operator.
- Debt servicing costs approved in the 2017 Rate Order are allocated between generation and T&D based on generation expenditures approved by the Energy Bureau in the 2017 Rate Order and certified by the FOMB, as well as actual spending since Fiscal Year 2017.

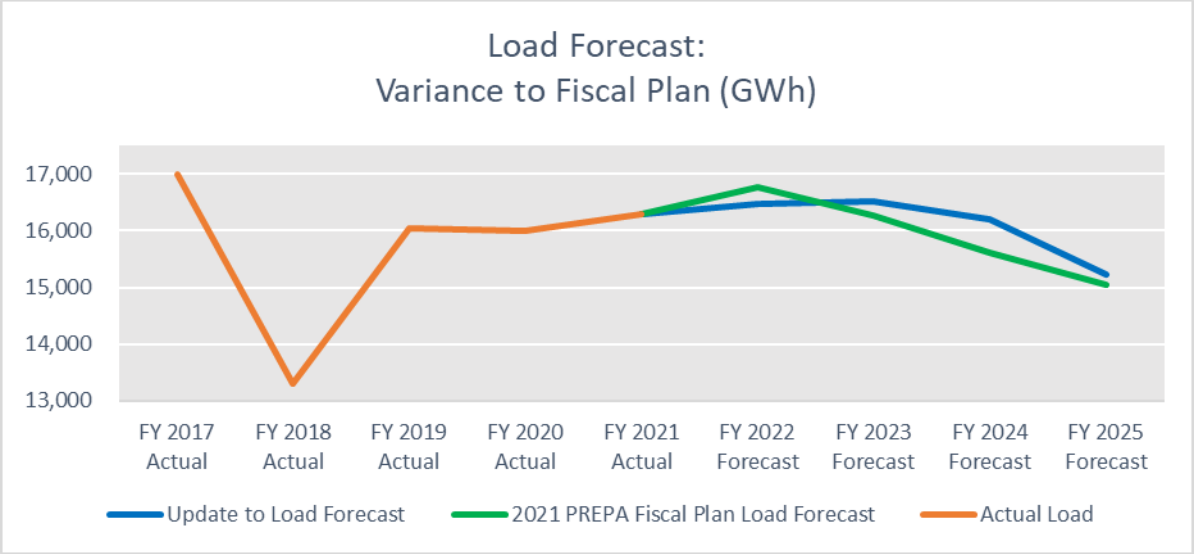
3.1.3 Updated Load Forecast

The updated system load forecast was completed using a consistent methodology, that yielded consistent results, to the information provided in the 2021 PREPA Fiscal Plan, as certified by the FOMB on May 27, 2021. For further information on load forecast methodology, please refer to Section 2.2 (Key Assumptions and Basis of Annual Budgets).

Please find below a comparison to the load forecast included within the 2021 PREPA Fiscal Plan. The green line denotes the load forecast certified by FOMB within the 2021 PREPA Fiscal Plan (updated as of June 2021). The blue line denotes the current LUMA load forecast used within Annual Budgets (updated as of March 2022).

Annual Budgets

Figure 3-1. Variance of updated load forecasts to fiscal plan forecast



4.0 Description of Activities

4.1 Department-Level Operation and Maintenance Activities

LUMA is continuing to carry out its responsibilities to manage and operate the T&D System while striving to continually improve customer service employing data-driven decisions with information available at the time, paired with knowledge from our LUMA employees. LUMA is driving execution of new policies, procedures and plans (including the ERP, VMP and security plans) and continuing to lay the foundation to provide for the safe and effective operation of the T&D System, while improving reliability and service to customers across Puerto Rico. LUMA fulfills its ongoing requirements as the operator, while building capabilities to enable efficiencies and prioritization across all activities to efficiently deploy federal funds for recovery of the T&D System and to improve performance. Activities also include advancing improvement programs which support the Recovery and Transformation Framework (refer to Section 2.1.3).

LUMA's work activities are split between the following four departments.

1. **Customer Experience**
2. **Operations**
3. **Utility Transformation**
4. **Support Services**

Please refer below to a description of the key O&M Services overseen by each of these departments.

1. CUSTOMER EXPERIENCE DEPARTMENT — KEY OPERATION AND MAINTENANCE ACTIVITIES

LUMA's Customer Experience department augments LUMA's drive to provide reliable and affordable electric power by establishing appropriate communication protocols and standard billing and collection practices that personify courtesy, capture efficiencies, and demonstrate proactivity. In executing its responsibilities on a day-to-day basis, LUMA is committed to continually and sustainably improving the customer experience, as exemplified in our Voice of Customer (VoC) initiative described below. Key functions include the following.

Billing Services

Primarily charged with ensuring that LUMA customers are billed in a timely manner using a modern, transparent customer bill which accurately displays amounts due, communicates value delivered, engages customer segments with unique messaging and drives higher levels of customer satisfaction (subject to PREB approval). This function is also responsible for ensuring that payments are promptly received and properly applied to customer accounts while supporting convenient payment channels for LUMA customers. Finally, this function verifies meter read availability (and accuracy), investigates potential theft and other energy irregularities and completes complex customer and account investigations.

Revenue Protection

The overall objectives of the Revenue Protection team are to increase collections and decrease delinquencies, thus reducing the number of Days Sales Outstanding (DSO) and minimizing the amount of

revenue “leakage.” As such, this function manages all collections efforts, generates the list of delinquent payers, maintains credit policies/standards and processes bankruptcy cases.

Regional Customer Service

Focused on delivering best-in-class customer service to reduce the number of interactions a customer needs to have with LUMA, this function performs both front-facing and back-office tasks. Specific tasks include serving walk-in customers to manage new services, making changes to billing and payment arrangements, and responding to metering issues, complaints, customer move requests, changes in services/rates and customer inquiries (particularly around billing). This team is also responsible for the management and integration of work procedures with Operations, and meets regularly with Operations to, at a minimum, improve customer satisfaction in areas of outages, communication and responding to work requests.

Contact Center

Charged with managing all aspects of customer interactions except for in-person interactions that occur in District Offices, the Contact Center’s scope and responsibilities focus on both agent-assisted (phone, chat, email and social media) and self-service (phone and Interactive Voice Response [IVR], website and mobile app) interactions. The Contact Center team manages thousands of daily customer interactions including general customer inquiries, high bill complaints, reported outages and service order requests to meet the customers’ needs. As a high-performance contact center providing exceptionally responsive service, operations are measured by Average Speed of Answer and Abandon Rate. Processes are designed to satisfy customers’ needs quickly and efficiently and are measured by First Contact Resolution Rate, agent call quality and overall Customer Satisfaction (CSAT).

Voice of the Customer

Responsible for capturing customer expectations, likes and dislikes, along with identifying, categorizing and consolidating confirmed wants and needs — the VoC function prioritizes this information relative to current options and then presents it to division leaders for full or partial implementation to improve overall delivery of the electric service. The focus of potential changes typically revolves around improving processes or quality of delivery, expanding/refining self-service channels and enhancing LUMA performance throughout the organization via training. Sources used to measure and trend the effectiveness of any new programs include J.D. Power surveys, post-interaction calls with customers (e.g., IVR surveys immediately following a call), speech and text analytics, internal process improvement metrics and quality assurance (QA) call monitoring (ensuring the proper level of customer care is provided).

Key Accounts

The overall objective of the Key Accounts team is to offer dedicated service to large industrial, commercial, municipal customers that have complex requirements. The main role of Key Accounts team is to navigate the LUMA organization on behalf of our key customers, providing a single point of contact for their end-to-end service needs.

FY2023 Key Activities

Key Customer Experience activities are summarized in the following table.

Table 4-1. FY2023 Customer Experience Key Function and Supporting Activities

Supporting Activity by Key Function	Primary Goals
Billing Service	
Monitor third party vendor, launching cancel / rebill efforts in production, stabilizing, and managing print costs, completing return mail optimization with enhancements, and evaluating address accuracy improvements	Improve Customer Satisfaction Operational Excellence
Continue to process payments	Improve Customer Satisfaction Operational Excellence
Continue to support the Customer Service department in managing and improving its IT systems (Oracle Customer Care and Billing [CC&B])	Improve Customer Satisfaction Operational Excellence
Continue to improve meter reading accuracy and billing accuracy	Improve Customer Satisfaction Operational Excellence
Continue to investigate energy irregularities, customer claims, and complaints received from PREB	Improve Customer Satisfaction Operational Excellence
Revenue Protection	
Refine operational dashboards and reporting practices to monitor collections and accounts receivable data	Operational Excellence
Continue to refine processes / practices around targeting customers and executing outbound calling campaigns	Improve Customer Satisfaction
Reduce aged balances on government and wholesale accounts	Operational Excellence
Continue to identify accounts for disconnect due to non-payment if there are changes in the associated executive order	Operational Excellence
Continue to manage and hold customers accountable for payment arrangements	Improve Customer Satisfaction Operational Excellence
Continue to review and ensure adherence to laws and regulations regarding credit policies and collection efforts	Improve Customer Satisfaction Operational Excellence
Regional Customer Service	
Continue to allow customers easier access and correspondingly quicker / more reliable service, particularly in the areas of receiving payments, establishing payment plans, starting new services, and addressing billing complaints	Improve Customer Satisfaction Operational Excellence
Continue to expand LUMA's presence in all communities and further develop and operationalize the Community Relations and Engagement Plan to encourage LUMA employee engagement with communities	Improve Customer Satisfaction
Continuously improve communication and coordination with other LUMA departments, enabling a more proactive approach in dealing with internal and external customers	Improve Customer Satisfaction Operational Excellence
Continue to support analyses and reviews of net metering applications	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Continue to support streetlight billing update Oracle CC&B	Operational Excellence
Contact Center	
Continue to improve contact center responsiveness in addressing customer needs through phone, email, chat, and other channels, as well as improve agent response accuracy to reduce the number of times a customer needs to contact LUMA	Improve Customer Satisfaction Operational Excellence
Rollout / operationalize new agent evaluation scorecards and calibration processes to measure and focus coaching efforts around performance and increase overall quality of customer experience	Improve Customer Satisfaction Operational Excellence
Continuously expand the ability to interact with customers through chat and various social media platforms	Improve Customer Satisfaction Operational Excellence

Voice of the Customer	
Create new agent evaluation scorecards and calibration processes to measure performance and identify coaching opportunities	Improve Customer Satisfaction Operational Excellence
Develop robust real-time and historical reporting to inform data-driven decisions on which to base processes and practices to focus resources	Improve Customer Satisfaction Operational Excellence
Create ability for customers to interact with LUMA through automated channels (e.g., use IVR or mobile app to report an outage)	Improve Customer Satisfaction Operational Excellence
Provide customer-centric training built around meeting pre-defined service level standards (ensuring compliance with applicable laws and regulations)	Improve Customer Satisfaction Operational Excellence
Gather VoC data to further analyze and articulate its use as a driver for continuous improvement through VoC Summits and leadership meetings	Improve Customer Satisfaction Operational Excellence
Key Accounts	
Continue to strengthen relationships with all key customers	Improve Customer Satisfaction Operational Excellence
Develop proactive solutions for large industrial, commercial, and municipal customers and improve customer contracts	Operational Excellence

Key Activities beyond FY2023

In addition to performing the normal day-to-day tasks, activities beyond FY2023 include:

- Continue to improve operational performance around billing exceptions and claims management and energy irregularity investigations
- Continue to improve the efficacy of LUMA's collection efforts and making refinements to current credit policies aimed at reducing accounts receivable and DSOs
- Using data from the physical assessments, continue to update joint-use billing and contracts and correct inaccuracies around streetlights
- Ongoing refinement of customer service including supporting customers with the use of digital channels and self-service options
- Maintenance and continuous improvement in use of additional self-service capabilities and ongoing development of requirements for additional training

2. OPERATIONS DEPARTMENT — KEY OPERATION AND MAINTENANCE ACTIVITIES

The LUMA Operations department oversees and manages day-to-day T&D work on the existing and expanding utility infrastructure to provide ongoing safe and reliable services to customers. This work is consistent with plans including the ERP and VMP and, where relevant and required, to fulfill legislative and regulatory obligations. As a result of Operations' functions and activities, LUMA will provide customer-centric reliable, resilient, safe, and sustainable electricity at reasonable prices. Key Operations functions include the following:

Operational Excellence

Operational Excellence develops and implements procedures for quality control (QC) and quality assurance (QA), overseeing commissioning of completed work, and the collection, analysis and reporting of operational performance, dispatch emergency crews and planning and scheduling plants field work.

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Transmission and Distribution — Lines

This function oversees operation and maintenance of the overhead and underground T&D Systems comprising approximately 2,700 miles of transmission and 31,900 miles of distribution lines. It is the lead division for restoring power during planned and unplanned customer outages. This division aims to provide safe, reliable electric service to customers with a team of well-trained, skilled employees. In accomplishing these goals, the division executes all field operations, including T&D line maintenance, substation work, new connections and all associated line work and activities on other physical assets used to deliver electric service.

Transmission and Distribution — Substations

The Operations department is also assigned responsibility for safely maintaining all T&D substations and telecom equipment. This function includes conducting assessment, inspection, and testing programs in compliance with regulatory mandates and in accordance with industry practices with a goal of stable, resilient operations. As such, this function supports both asset management and system operations in assuring safe, cost-effective, and reliable electric service to LUMA's customers, including providing contingency plans for equipment and apparatus in the event of any emergency or failure.

Vegetation Management

LUMA is implementing systematic vegetation management practices with a focus on employee and contractor training and safety. Vegetation management's overall goal is to reduce tree-caused customer outages and thereby improve customer satisfaction. This function aims to use an integrated approach that optimizes vegetation inspection and maintenance intervals, along with identifying and removing high-risk trees. Under this approach, LUMA's current focus is on urgent outages, and next on reestablishing Right of Way (ROW) on worst performing feeders and determining the viability of selective application of herbicides, in compliance with Puerto Rico and federal laws, and thus establishing a foundation for integrated vegetation management. In parallel, the vegetation management is instituting industry best practices in controlling vegetation at LUMA's substation facility sites and instituting industry best practices in supporting, through reactive and corrective maintenance, T&D Operations' service restoration activities.

Materials Management

Materials Management is leveraging a warehousing network consisting of one central distribution center, six regional distribution centers and 16 district warehouses. Materials and contract management teams support T&D Operations and the Capital Programs by optimizing inventory and assuring efficient tracking for material, inventory levels and parts from initial order through to receipt, storage, delivery and/or provision to contractors, and subsequent disposal at end of life. Materials Management executes and maintain efficient contracts for Operations goods and services while supporting the capital programs through large scale material supply agreements.

Fleet Management

Charged with the overall management of land vehicles (ranging from light and heavy-duty vehicles to construction and material handling equipment) and associated repair shops. Fleet management focuses on vehicle and equipment safety, compliance to regulations, implementation of FMIS and telematics, repairs, and optimization of the shop facilities, improving service to its internal customers and achieving operational excellence through deployment of new systems, processes, and operator training.

FY2023 Key Activities

Key Operations activities are summarized in the following table.

Table 4-2. FY2023 Operation Key Function and Supporting Activities

Supporting Activity by Key Function	Primary Goals
Operational Excellence	
Ensure quality consistency across completed field work and identify improvement opportunities and develop applications to improve implementation of operating processes	Prioritize Safety Improve Customer Satisfaction Operational Excellence
Continue to develop and roll-out new work methods and field bulletins to communicate to crews on engineering standards, new methodologies, and industry practices	Prioritize Safety Operational Excellence
Develop and expand dashboards to support data driven decision making	Operational Excellence
Transmission & Distribution Lines	
Conclude the use of skilled temporary field workers by continuing to train field employees in safe work methods associated with specific roles, upskill training of line workers, and train employees in their new roles in ERP	Prioritize Safety Improve Customer Satisfaction System Rebuild and Resiliency Operational Excellence
Further improve Low Voltage and High Voltage Work Management Systems to better respond to customer requests and requirements effectively, including replacing non-functioning meters, new customer connections, power quality inspections	Prioritize Safety Improve Customer Satisfaction Sustainable Energy Transformation
Continue to support emergency response planning and the implementation and refinement of the ERP, along with conducting ongoing training exercises and emergency drills	Prioritize Safety Improve Customer Satisfaction Operational Excellence
Maintain inventory of proper tools and equipment to support safe and efficient work	Prioritize Safety Operational Excellence
Expand initiative to extend outage response coverage	Improve Customer Satisfaction
Ongoing work across the service areas focused on cost controls, reducing energy theft, emergency repairs (outages), maintenance and preventive work and customer service	Improve Customer Satisfaction Operational Excellence
Transmission & Distribution Substations	
Provide safety and technical training to all field employees to (1) align with operational requirements, and (2) address gaps identified in competency assessments	Prioritize Safety Improve Customer Satisfaction
Cross train field crews (as necessary) to ensure efficient performance of preventive and emergency maintenance	Prioritize Safety Improve Customer Satisfaction Operational Excellence
Train employees on all new equipment and apparatus to ensure performance of safe and efficient work	Prioritize Safety Operational Excellence
Vegetation Management	
Reinforce focus on employee and contractor training and safety	Prioritize Safety Operational Effectiveness
Transition from a largely reactive posture to a more proactive integrated approach that optimizes inspection and maintenance intervals while re-establishing Right-of-Ways (ROW)	Prioritize Safety Improve Customer Satisfaction Operational Effectiveness
Continue to address vegetation-related reactive and corrective maintenance in support of service restoration efforts or as an attempt to prevent future unplanned outages	Prioritize Safety Improve Customer Satisfaction Operational Effectiveness

Materials Management	
Procure equipment to ensure safe and efficient storage and handling of material and hardware at warehouses and storage facilities and execute contracts to procure services and equipment to safely transport and store environmentally sensitive materials/scrap	Prioritize Safety Operational Excellence
Prepare for launch of various capital projects while maintaining support for daily operations	Operational Excellence System Rebuild and Resiliency
Continue to optimize and improve existing resources, systems, and processes	Operational Excellence System Rebuild and Resiliency
Fleet Management	
Continue to perform remediation required to bring fleet into compliance with Department of Transportation (DOT) and Occupational Safety and Health Administration (OSHA)/American National Standards Institute (ANSI) regulations	Prioritize Safety Improve Customer Satisfaction Operational Excellence
Continue training / refreshing of Fleet program employees to comply with maintenance requirement standards for heavy-duty fleet vehicles	Prioritize Safety Operational Excellence
Perform remediation required to bring shops facilities into compliance, OSHA, Environmental Protection Agency (EPA) and health department	Prioritize Safety Operational Excellence
Continue to test, inspect, maintain, and repair usable fleet assets, and optimize maintenance of light-duty vehicles	Prioritize Safety Improve Customer Satisfaction Operational Excellence
Continue to rectify identified gaps in the areas of fleet maintenance data collection, telematics, and fuel program management	Improve Customer Satisfaction Operational Excellence

Key Activities beyond FY2023

In addition to performing the normal day-to-day tasks, activities beyond FY2023 include:

- Continue to develop, implement, and train procedures, processes, and practices to improve the overall quality of work performed, as well as the safety of those in the field
- Continue to focus on service restoration, including the use of technology and targeted maintenance activities
- Continue to provide effective Vegetation Management support, incorporating the basic tenets of Integrated Vegetation Management, thus resulting in a steady decrease of tree-caused outages. As the ROW reclamation occurs, an optimum Vegetation Management cycle is put in place, and “high-risk” trees are removed, there will be a natural transition from a highly reactive posture to one that proactively remediates tree-related risks before an outage occurs

3. UTILITY TRANSFORMATION DEPARTMENT — KEY OPERATION AND MAINTENANCE ACTIVITIES

LUMA’s Utility Transformation department provides the technical and programmatic framework required to deliver safe and reliable service to its customers, supports key initiatives as defined in the SRP and maintains focus on the long-range vision articulated in the IRP. Key functions include the following.

Business Transformation

Responsible for coordinating the development and delivery of new programs, projects and services that support the clean energy transition. These include net energy metering, energy efficiency, demand response, and electric vehicles. The Business Transformation team also supports the development of research and business planning for new grid transformation technologies such as AMI and is also

responsible for cross-departmental coordination of LUMA's activities related to the utility-scale solar interconnection process.

Asset Management

Asset Management continues its focus on the T&D System's assets, by performing system planning studies and analysis to support preliminary engineering for T&D capital projects. This work aligns with the IRP Order and general guidance, enabling a sustainable energy transformation in Puerto Rico. In addition, Asset Management ensures existence of appropriate capital investment and maintenance planning regimens, research, governing, auditing processes, required IT OT infrastructure and requisite skills and competencies. These elements ensure (1) compliance with all regulatory and legislative mandates, (2) actions to meet system load requirements and interconnection of renewable energy, (3) initiatives to improve system reliability (as measured by System Average Interruption Frequency Index [SAIFI] and System Average Interruption Duration Index [SAIDI]), (4) new innovations and designs to improve system resiliency, (5) implementation of modern protection, control and automation systems to accommodate and successfully integrate distributed energy resources (DERs), (6) risk-based analytics are used to inform funding and planning/prioritization decisions and (7) development and maintenance of an asset registry to house critical asset performance and condition data.

Planning

The primary objective of system planning is to develop a rational, orderly, and economic framework for the current and future energy infrastructure with the goals of providing reliable electric service to customers and supporting load growth in a cost-effective manner. LUMA continuously analyzes the adequacy of the grid to determine if the system meets the current demand for energy and the anticipated future demand while also calculating how best to integrate renewable energy sources and non-wire alternatives.

Engineering

Engineering is focused long-term on supporting LUMA's mission to modernize the grid. It is responsible for the design of the T&D System, developing and maintaining engineering and maintenance standards, establishing criteria for assessment, test, and maintenance programs, performing QA functions, and overseeing the streetlight program. These activities are performed in accordance with applicable Puerto Rico laws and regulations governing the practice of engineering on the island.

Capital Programs

Charged with assuring effective and efficient delivery of capital projects, this function includes the formation and operation of (1) the PMO to design and ensure adherence to the project execution platform, (2) the T&D PMOs, charged with capital project execution, (3) the Project Controls office, providing the ability to produce cost and schedule information to inform project management and contracting decisions, along with generating actionable reports, (4) the Construction and Commissioning Management office, overseeing field work to ensure adherence to pre-established safety and construction standards and facilitate seamless acceptance of completed construction to Operations, (5) the Estimating office, charged with preparing project estimates and (6) the Risk Management office, which assesses project risks, recommends appropriate mitigation in collaboration with the relevant project teams and monitors these risks on an ongoing basis.

System Operations

Operates the electric system 24 hours a day, 7 days a week, from five control centers. The main activities are (1) performing energy balancing by dispatching generation in accordance with the system load forecast, (2) managing planned and unplanned system outages while maintaining system stability, (3) reacting promptly and taking appropriate measures during system events to limit the propagation of disturbances and prevent a system collapse and (4) performing service restoration management. Operating the electric system efficiently is a balancing act between configuring the system to reduce energy losses and to economically dispatch the generation (ensure that the cost-effective units are prioritized in the dispatch sequence) without compromising the system reliability and stability.

Metering

The department manages and supervises the meter shop's testing activities, as well as sample testing of all installed meters, with the purpose of assuring revenue protection and equitable customer treatment through accurate billing. Improving metering systems and processes, as well as creating strategies to decrease losses and enhance revenue.

FY2023 Key Activities

Key Utility Transformation activities are summarized in the following table.

Table 4-3. FY2023 Utility Transformation Key Function and Supporting Activities

Supporting Activity by Key Function	Primary Goals
Business Transformation	
Manage the ongoing delivery and continuous improvement of the Net Energy Metering program	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Finalize program plans and obtain PREB approval for energy efficiency, demand response and electric vehicle programs, and provide input on other regulatory proceedings such as the Puerto Rico Cost Test. Begin implementation of energy efficiency, demand response and electric vehicle programs	Improve Customer Satisfaction Sustainable Energy Transformation
Coordinate business planning for grid modernization pilot projects	Sustainable Energy Transformation System Rebuild and Resiliency
Provide input on DER related matters to assist with the PR100 study activities	Sustainable Energy Transformation System Rebuild and Resiliency
Coordinate technical activities related to the procurement and interconnection of utility-scale renewable energy projects	Sustainable Energy Transformation
Explore additional sources of federal funding for grid modernization and distributed energy resource programs	Improve Customer Satisfaction Sustainable Energy Transformation System Rebuild and Resiliency

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Asset Management

Continue to evaluate and implement key initiatives including T&D standards, area planning studies, walkdowns / assessments of problematic reliability areas, reliability and renewables integration studies, T&D substation contingency studies, and deployment of distribution automation	Prioritize Safety Operational Excellence System Rebuild and Resiliency
Finalize and rollout planning criteria to provide guidance for planning and engineering teams in designing the system	Prioritize Safety Operational Excellence System Rebuild and Resiliency Sustainable Energy Transformation
Optimize use of OMS requirements and methods / metrics to report reliability performance (T&D) and estimated service restoration times. Investigate and implement new functionality and features within the OMS system and review and refine the criteria to assist field workers in properly reporting outage information	Improve Customer Satisfaction Operational Excellence
Plan mitigations to problematic areas within programs relating to protection schemes, supervision, and control of substations	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Implement IT OT systems to support functions around maintenance and prioritize based on health and criticality, and through execution of the PEDC program, correct asset management and GIS data and information, establishing “sources of truth”	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Develop asset lifecycle plans and Long-Range Maintenance Program for the most critical asset classes	Improve Customer Satisfaction System Rebuild and Resiliency Operational Excellence

Planning

Area planning to identify and mitigate potential conditions within the system where overloaded equipment or reduced reliability may occur	Prioritize Safety Improve Customer Satisfaction System Rebuild and Resiliency
Optimally placing renewable energy sources in an effort to determine more efficient and cost-effective points of interconnection (POI) to the T&D System	Improve Customer Satisfaction Sustainable Energy Transformation
Ideally sizing and placing energy storage to increase reliability and resiliency while reducing security violations	Improve Customer Satisfaction System Rebuild and Resiliency Sustainable Energy Transformation
Planning transmission using NERC’s standards as a best practice	Operational Excellence System Rebuild and Resiliency Sustainable Energy Transformation
Creating a dynamic system model to help further identify potential stability violations and mitigate them	Improve Customer Satisfaction System Rebuild and Resiliency

Engineering

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Continue to refine LUMA standards considering industry norms and ensuring they are based on what is required to rebuild a T&D System in Puerto Rico	Operational Excellence Prioritize Safety Improve Customer Satisfaction System Rebuild and Resiliency Operational Excellence
Update / develop maintenance programs for critical system elements with specific focus on breakers, transformers, relays, batteries, and control buildings	Improve Customer Satisfaction Operational Excellence
Update / develop test and assessment programs including pole test and treat program and infrared (thermography) programs,	Operational Excellence System Rebuild and Resiliency
Implement updated material / equipment specifications and Standards in accordance with LUMA's Design Criteria Documents (DCDs) and industry best practices	Operational Excellence System Rebuild and Resiliency
Continue to manage engineering contracts	Operational Excellence System Rebuild and Resiliency
Evaluate, endorse, and approve connections for new development projects	Operational Excellence Improve Customer Satisfaction

Capital Programs

Implement a project management system consisting of: ▪ Appropriate software to generate project schedules and budgets, and manage receipt / issuance of documentation ▪ Project management playbook (execution roadmap, reporting requirements, and process maps) ▪ QA / QC practices ▪ Document control practices ▪ Continuous improvement and lessons learned process	Operational Excellence System Rebuild and Resiliency
Develop a project management competency framework to drive personal development	Operational Excellence
Improve and develop construction standards, practices, and procedures through to commissioning and define project documentation closeout requirements. Develop and conduct training on the full range of project execution steps from initial identification to commissioning / closeout	Prioritize Safety Operational Excellence System Rebuild and Resiliency
Design project reporting framework to address the informational needs of all stakeholders as well as a project estimating handbook to drive creation of project budgets and schedules and define accuracy expectations	Operational Excellence System Rebuild and Resiliency
Continue to establish expectations regarding safety, environmental, regulatory, permitting and licensing compliance and planning. Define and implement outage and permit planning and coordination process	Prioritize Safety Improve Customer Satisfaction Operational Excellence System Rebuild and Resiliency

System Operations

Operate the system on a 24-hour / 7-days per week basis	Operational Excellence
Perform the following sub activities on an ongoing basis as part of operating the system: ▪ Update energy dispatch tables ▪ Assess impact of weather and pattern changes on system loads and possible outages ▪ Conduct system event investigations ▪ Coordinate outages between generation and transmission ▪ Develop Annual Generation Outage Schedule ▪ Maintain Emergency operating planning and preparedness for System Operations ▪ Report on system performance	Prioritize Safety Improve Customer Satisfaction Operational Excellence System Rebuild and Resiliency

Prioritize safe operations and restoration process with control and management of OMS in accordance with the Restoration annex of the LUMA Emergency Response Plan	Prioritize Safety Improve Customer Satisfaction Operational Excellence System Rebuild and Resiliency
Continue Improving Automated Generation Control (AGC) in Collaboration with Plant Operators to reduce impact of load shedding and frequency excursion on the system	Improve Customer Satisfaction
Continue progressing the Energy Management System (EMS) replacement and Control Center Rebuild projects	Prioritize Safety Improve Customer Satisfaction System Rebuild and Resiliency
Continue the development of Transmission and Generation procedures and execute training program for new operators	Operational Excellence

Metering

Continue to procure meter shop test equipment	Operational Excellence
Implement Sample Test Program for residential meters to test for accuracy	Improve Customer Satisfaction Operational Excellence
Perform Sample Test Program for commercial and industrial meters to test for accuracy, and correct configuration	Improve Customer Satisfaction Operational Excellence
Improve the testing procedure for meters suspected of being tampered with	Operational Excellence
Continue to perform first quality checks on incoming meter shipments in accordance with ANSI	Operational Excellence
Develop an Advanced Meter Infrastructure (AMI) roadmap for implementation	Improved Customer Satisfaction System Rebuild and Resiliency Sustainable Energy Transformation

Key Activities beyond FY2023

In addition to performing the normal day-to-day tasks, activities beyond FY2023 include:

- Manage DG meter activation to 30 days
- Manage Energy Efficiency and Demand Response programs to meet targets
- Continue to expand studies to provide support to Capital Programs (e.g., undergrounding, voltage conversion, pole replacement, equipment replacement) and the technical loss reduction program
- In addition to the successful implementation of the Hosting Capacity Maps, LUMA will continue to introduce new technology programs (e.g., battery and Direct Current [DC] monitoring systems, predictive reliability, and power quality improvements)
- Implement the new EMS
- Coordinate all activities to manage the interconnection of utility scale renewable energy projects
- Continue to report reliability performance by identifying trends, benchmarking results, determining root causes, and developing and implementing reliability improvement initiatives
- Track and ensure compliance with maintenance, security and safety requirements for protection and control (P&C), SCADA, Telecom and substation and distribution automation
- Introduce more targeted and efficient maintenance practices including Condition-Based/Predictive Maintenance

- Modernize data systems and use of data to support data-based decision making for maintenance and system improvements

4. SUPPORT SERVICES DEPARTMENT — KEY OPERATION AND MAINTENANCE ACTIVITIES

LUMA's Support Services department provides functions that are not directly connected with the assets or customer but important to LUMA's success in meeting its mission and achieving the key goals. They include the following.

External Relations

We are talking more to our customers as part of our broad commitment to transparency and customer communications, and LUMA forecasts to continue to respond to increasing requests with entities such as the P3A, the Energy Bureau, FOMB, as well as the Puerto Rico House of Representatives and Senate. These requests are expected to continue to require considerable resources and time and involve a significant responsibility of preparing LUMA employees for public hearings to ensure LUMA complies with legislative or legal requests.

IT OT

With four major areas under its purview (Technology and Infrastructure, Technology Enablement and Sustainment, Security and Compliance, and IT OT Business Operations), IT OT is responsible for:

- Developing the information and operational technology investment strategy
- Overseeing the execution of the technology plan, enabling, and initiating operational efficiency improvement initiatives associated with technology
- Establishing technology organizations, defining the technology business model, and ensuring the competence of the team in each area of the business
- Developing the business technology and governance strategy and integrating business strategy with technology
- Establishing the fundamental operation model for technology, managing associated resources including financial controls and accounting, site and facility administration and HR planning and administration
- Providing oversight of the overall cyber security landscape and protection

In executing these responsibilities IT OT supports over 20 programs and applications covering key business functions within virtually every organization within the utility.

Finance and Risk Management

Consists of leading the development of budgets, maintaining, and administering the budget system(s) and uploading of the final budgets into the financial software. Finance is also responsible for accounting for the O&M cost centers as well as accounting for project and capital spend, cash management, enterprise risk management, the procurement of all insurance coverages, tax reporting, internal and external financial reporting, accounts payable and payroll administration. Finance also supports all external filings that are tied to financial information, provides key resources to support finance-related technology projects, works to improve process efficiencies through the leveraging of technology and other tools or methods, and provides shared service support for the PREPA financial audits and many of PREPA's accounting requirements. In addition, Finance continues to be focused on process improvements,

enhancements to internal controls and leveraging technology for the overall improvement of the timeliness, accuracy and completeness of financial reports, contracts and paying invoices, among others. Finance is also focused on improving the insurance procurement process within the utility including broadening coverage and the development of an enterprise risk model.

Regulatory

Working alongside LUMA Departments, Regulatory supports the execution of alignment between LUMA and Puerto Rico's energy policy, and ensuring LUMA's transformation of the utility, improving customer satisfaction and deliver safe and reliable electricity. Focuses on working closely with external stakeholders and LUMA teams to set forth the foundations and develop initial plans for grid modernization as well as supporting 26 active dockets, including the Budgets, SRP, SOP, Performance Metrics, and Permanent Rate, among others. Regulatory completes technical studies to inform generation and system planning to support compliance with the SOPs and the IRP, as well as developing the next IRP. Regulatory also identifies requirements and supports the development of plans related to renewable integration, distributed energy resources, energy efficiency and new technologies.

Supply Side Contract Administration

Supporting generation resource planning and administration of supply side contracts, the team is responsible for:

- Power Purchasing and Operating Agreements (PPOA) and GridCo GenCo HoldCo Operating Agreement administration, along with administering and build relationships with current Independent Power Producers (IPP), and integrating new IPP connections to the system
- Monitor and review all entities performing in accordance with applicable SOPs, along with complying with all required reporting and analysis
- Resource planning with review of overall generation resources in Puerto Rico, and develop plans for future resource integration

Procurement

Maintaining overall responsibility for the procurement of goods and services, internal customer service and purchase order management, Procurement supports all T&D functions, including the added requirements from FEMA and COR3. Focusing on speed-to-market, Procurement strives to support LUMA Operations and improvement programs in a manner that minimizes schedule impacts and ensures inventories are maintained according to plan.

Land and Permits

Managing standards, protocols, systems, procedures, and processes to administer PREPA's property rights related to the T&D System and obtain and comply with necessary permits to carry out operations and capital projects. Focusing on improving the efficiency of processes, minimizing disputes/legal actions, and improving settlement processes, as well as effective management of permits required for LUMA to carry out its responsibilities. Activities include:

- Execute land acquisitions
- Ensure that obligations under land rights contracts are met
- Settle disputes with minimal legal entanglements

- Achieve consistency between the use of third-party crossings and pole attachments and legislated requirements/industry practices
- Ease accessibility of land records and non-environmental permits
- Maintain consistency and standards in permit applications, renewals, and associated compliance

Health and Safety

Charged with ensuring system wide compliance with LUMA's safety program with emphasis on developing a safety culture. The department is responsible for:

- Preventing occupational injuries, spills, and other incidents by leveraging field specialists, industrial hygienists, training specialists, and administrators to working collaboratively with field-based teams
- Specific tasks include managing hazard identification and mitigation programs directing incident management and investigation protocols, identifying strategies for injury prevention and return-to-work plans, and completing field inspections
- Works with contractors to ensure safety programs are aligned with industry standards and LUMA safety culture
- Engages with internal departments and community partners in the development of programs for public safety and crisis management
- Develops, implements, and manages LUMA safety and environmental programs, policies, and procedures
- Reports on safety and environmental performance across the organization and identifies trends and improvement areas
- Identifies and coordinates the required safety and technical training programs
- Reviews and revises emergency response and business continuity plans, ensures appropriate resourcing and training, and completes exercises in accordance to plans

Facilities

Responsible for the operation and management of owned, leased and otherwise occupied commercial use facilities for the T&D business and acquisition and decommissioning of property to suit the operational needs of the T&D business . In doing so, Facilities maintains a focus on maintaining safe and healthy occupancies, along with overall management of risks and liabilities.

Specific activities include:

- Property and facility management, dealing with the ongoing care and maintenance of LUMA facilities ranging from performing janitorial services to maintenance and repairs. Moving to a preventative service model from a run-to-fail/minimum viable state service delivery
- Space planning, charged both with planning and design of architectural, electrical, mechanical, and civil design as well as maintains accurate floor and furniture plans, performs restacking planning, and provides internal move management/relocation services
- Facility capital management is responsible for the planning and implementation of improvement and replacement projects on facilities. Ensuring standards are implemented to provide resilient, redundant, and reliable facilities
- Real estate portfolio management, creating and maintaining standards for safe and healthy occupancy of facilities, creating processes and policies for real estate transactions, occupation of facilities, real estate optimization and ongoing management of the portfolio

Total Rewards / HR Operations

Focused on the people side of the business, this function manages the entire benefit suite of products (health and wellness benefits and retirement), employee relations and engagement, talent acquisition and workforce management, HR field operations and employee compensation.

FY2023 Key Activities

Key Support Services activities are summarized in the following table.

Table 4-4. FY2023 Support Services Key Function and Supporting Activities

Supporting Activity by Key Function	Primary Goals
Health & Safety	
Continue health and safety, and technical training for LUMA employees to continue to develop a safe and competent workforce. Refine, communicate, and enforce minimum PPE requirements	Prioritize Safety Operational Excellence
Continue to improve and refine standardized incident investigation process with emphasis on root-cause analysis, reporting of near-misses, and identification of field hazards	Prioritize Safety Operational Excellence
Continue to improve and refine contractor management program	Prioritize Safety Operational Excellence
Execute public safety strategy to improve customer and public awareness of electrical hazards	Prioritize Safety Improve Customer Satisfaction
Conduct field investigations and inspections to assist with ensuring compliance across the organization. Complete environmental evaluations and implement mitigations for system operations and improvement programs	Prioritize Safety Operational Excellence
Ensure organizational planning and readiness in response to emergencies and crises	Prioritize Safety Improve Customer Satisfaction
IT OT	
Define, develop, and maintain technology solutions for: • technology strategic intelligence and overall technology process framework to support internal procedures • financial, organizational, HR and sourcing strategies • long term business focused technology strategy in collaboration with business representatives	Operational Excellence
Monitor and map current and emerging technologies to required business capabilities, as well as define and communicate the strategic intent regarding the utility's use of technology	Operational Excellence
Continue to analyze and mitigate potential process and cyber risks	Operational Excellence
Finance and Risk Management	
Continue to build and maintain an Internal Controls Framework to support corporate financial policies & procedures	Operational Excellence
Continue development of functional design and assist in implementation of financial systems for the streamlining of the Procure-to-Pay cycle and for automated labor allocation to support FEMA reimbursements and the accurate reporting of capital projects	Operational Excellence
Improve the processes for gathering information in support of the procurement of insurance process. Continue to develop an enterprise risk management process and a risk management information system to allow a more fulsome analysis of risks	Operational Excellence
Update and enforce industry standard accounting policies and procedures that comply with the latest laws and regulations	Operational Excellence

Annual Budgets

Continue to close the books accurately and timely monthly and produce accurate and useful reports and variance analysis for internal and external stakeholders. Specifically manage the enterprise annual budget process and provide regular forecast updates as well as budget variance reporting. Continue the build-out of skills and capabilities in financial reporting	Operational Excellence
Manage cash resources and process invoices allowing for the timely and accurate payment of vendors	Operational Excellence

Regulatory

Continue to develop report structures and templates to support meeting all regulatory and T&D OMA reporting requirements	Operational Excellence System Rebuild and Resiliency
Drive the preparation and submittal of the regulatory and T&D OMA mandated reports. Specifically support reporting requirements within 26 active dockets in front of the Energy Bureau including Budgets, SRP, SOP, Performance Metrics, Permanent Rate, Energy Efficiency, Demand Response, among others	Operational Excellence System Rebuild and Resiliency Sustainable Energy Transformation
Prepare for future rate cases and development of the updated IRP as well as the EV Infrastructure Plan	Operational Excellence System Rebuild and Resiliency Sustainable Energy Transformation
Develop systems and processes to increase transparency of filings supported by well-defined solutions and data-driven decisions	Operational Excellence System Rebuild and Resiliency

Supply Side Contract Administration

Facilitate steps to collect and report generation operating data to support SOP reporting requirements, and for future studies and analyses	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Develop Resource Planning capability and improved data management in order to present data driven resource planning strategies to the Energy Bureau for future annual reviews and to support the IRP and renewable procurement process	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Develop standardized LGIA and PPOA for new capacity additions. Develop operating procedures to administer existing and new PPOAs. Work with Engineering to support PREB consultant administering the Resource Procurement process	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation
Complete re-engineering of the independent power producer invoice process and integration of multiple spreadsheet models to automate process, shorten cycle times, and improve accuracy of $50 million per month of invoices	Improve Customer Satisfaction Operational Excellence Sustainable Energy Transformation

Procurement

Continue to train the organization on new procurement and contracting processes, procedures, systems, and tools	Operational Excellence
Actively manage the competitive bidding process	Operational Excellence
Further negotiate and finalize standard terms and conditions	Operational Excellence
Convert approved requisitions into purchase orders and manage the overall purchase order process	Operational Excellence
Continue to work with Regulatory and Capital departments to facilitate deployment of federal and non-federal funds	Operational Excellence System Rebuild and Resiliency

Annual Budgets

Develop supply chain and procurement strategy to support procurement and contract management	Operational Excellence System Rebuild and Resiliency
Land & Permits	
Test and evaluate effectiveness of procedures for acquiring land and the administration of land rights once obtained	Operational Excellence System Rebuild and Resiliency
Develop procedures for third-party crossing agreements	Operational Excellence Improve Customer Satisfaction
Develop procedures for other party pole attachments	Operational Excellence
Develop dispute procedure for encroachments	Operational Excellence
Develop project plan and assess systems to manage land records	Operational Excellence
Facilities	
Develop an enterprise wide acquisition and lease process for Federal Programs	Operational Excellence
Refinement of facilities management programs, processes, Computerized Maintenance Management System (CMMS)	Operational Excellence
Architectural and engineering assessment at all facilities. Creation of standards and technical specifications	Prioritize Safety Operational Excellence
Procure services to perform repairs, make improvements and remediate / reconstruct facilities as required	Prioritize Safety Operational Excellence
Continual training and education programs around promoting a safe and healthy work environment	Prioritize Safety Operational Excellence
Manage relationships, flow of communication, commitment to our customer groups to a centralized real estate and facility services model	Operational Excellence
Total Rewards / HR Operations	
Continue to administer and enhance current offerings (Insurances, Wellness, and related programs)	Prioritize Safety Operational Excellence
Continue to implement annual reviews for all employees and incentive bonus program	Operational Excellence

Key Activities beyond FY2023

In addition to performing the normal day-to-day tasks, activities beyond FY2023 include:

- Refining and maintaining technology strategic intelligence
- Articulating strategic alignment principles regarding the deployment and use of technology
- Revisiting and refreshing technology strategy and alignment
- Refining and updating the technology business model
- Implementing a financial consolidation system and ad hoc reporting tools
- Optimizing facility infrastructure, operations, and environmental impacts
- Reconstructing Emergency Operations Center facilities and implementing automatizations to emergency, business continuity, and crisis systems
- Designing and implementing a culture awareness program focused on human performance fundamentals and continuing to build organizational safety fundamentals
- Expand public safety campaign in collaboration with system restoration efforts
- Implementing an integrated land management system
- Create and implement structured program and procedures to manage current and future PPOAs in line with expected 10x increase in PPOAs over the next three years

4.2 Improvement Programs

Based on the Recovery and Transformation Framework outlined in Section 2.1.3, LUMA's list of initial investment initiatives was developed to a) remediate concerns identified through gap assessment, b) conduct known infrastructure repair, replacement or hardening projects and c) meet regulatory requirements (such as the IRP).

These investment initiatives were bundled together into programs of similar interdependent initiatives. Program teams developed a Program Brief, detailing the scope of work for each program including cost estimates, benefits, timeframe, and resource requirements. LUMA's programs have been further organized into portfolios that together cover all functional areas of the utility. Please refer to Appendix C for further description of these portfolios, a summary of the Improvement Portfolios is provided in the table below, with additional detail provided in Schedule 5.4.

Table 4-5. Improvement Portfolio Spending Profile ($ million, real)

Portfolio	FY2023	FY2024	FY2025
Customer Service	135	119	139
Distribution	179	306	577
Transmission	127	279	374
Substations	135	173	71
Control Center & Buildings	51	91	89
Enabling	113	124	122
Support Services	102	92	91
Grand Total	**842**	**1,185**	**1,463**

4.3 Shared Services

LUMA is responsible for delivering Shared Services to perform certain administrative and operational services in connection with the operation and management of PREPA's legacy generation assets (GenCo) and their production of electricity. These responsibilities were contemplated as outlined in Annex VI of the T&D OMA and are governed by the Shared Services Agreement (SSA) between PREPA, P3A and LUMA effective June 1, 2021.

The purpose of these services is to enable PREPA Generation to continue independent operation during the period, also known as the Shared Services Period, after LUMA began operation of the T&D System but before and during a transition period when the planned independent operator(s) assumes responsibility and control of PREPA's thermal generation assets. Under the SSA LUMA provides PREPA with services that generally fall into three (3) areas:

- T&D Operations – This is limited to technical O&M support for certain electrical equipment under the responsibility of PREPA at generation plant locations but that were historically supported by its Substation and Lines departments (now LUMA). This O&M is focused on the power transformers, relays, and electrical protection and control devices that function on the PREPA side of the demarcation of plant responsibilities. This O&M work is specified by PREPA and performed by LUMA.

- Information Technology – This support provides access and services to PREPA on IT OT infrastructure managed by LUMA. Examples include enterprise software applications, computer and communications networks, IT security, etc. utilized by PREPA for GenCo activities.
- Finance and Accounting – This includes numerous general accounting activities (e.g., Accounts Payable, Property and Plant Accounting, General Ledger activities, Treasury activities, etc.) provided by LUMA for PREPA as well as the placement of insurance policies covering PREPA generation assets and activities.

The specific scope, estimated labor resources, and estimated annual budget for the Shared Services are presented in the SSA. The Shared Services Fiscal Year 2023 budget was estimated at $60 million; 92% of this budget ($55 million) is Generation's share of allocated costs for non-labor items such as insurance policies and IT OT software and infrastructure. The balance, $5 million (or 8%), is the budgeted LUMA labor cost to provide the services.

The costs for the Shared Services activities are considered part of Generation Pass-Through Expenditures incurred by PREPA in accordance with the T&D OMA. Under the SSA, LUMA provides the Shared Services on an interim basis until up to six months after PREPA has transferred O&M responsibility for its legacy generation fleet to an independent Generation Operator(s); or earlier if the Shared Services are terminated or reduced at PREPA's discretion. Unless otherwise mutually agreed, LUMA will cease to provide Shared Services three years after June 1, 2021.

LUMA has consistently applied the cost of these services for all three years of these Annual Budgets, noting that the transition timing to an independent Generation Operator(s) is unknown.

GenCo Shared Services expenses for 2023 are summarized in the table below and constitute the 2023 Shared Services expenses budget basis. The shared portion is included within the Generation Budget as per T&D OMA requirements within Schedule 5.1 (line 10). A summary follows.

Table 4-6. 2023 – 2025 Shared Services ($ million)

	2023	2024	2025
Labor	5	5	5
Property & Casualty Insurance	44	45	46
Security	2	2	2
IT Service Agreements	8	8	8
Utilities & Rents	0	0	0
Other	0	0	0
Subtotal	**59**	**60**	**61**
2% Reserve for Excess Expenditures	1	1	1
Shared Services Total	**60**	**61**	**62**

As summarized above, the majority of the Shared Services expenses are non-labor costs and these non-labor items are predominantly the allocation of Generation related costs (e.g., insurance [~75% of overall costs] and of IT service agreements (e.g. enterprise software and network [~13% of overall costs.]) that are directly attributed to generation. The labor expenses summarized above are predominantly related to

the support activities that are expressly identified in Exhibit A of the SSA (including accounting, finance, T&D technical support related to assets interconnected to generation assets within plants) that historically were provided by PREPA at a corporate level and are currently necessary to support the generation workforce and operations as described in Annex VI.

Shared Services expenses are presented within the Generation Budget. Revision of the Shared Services scope of activities does not impact the overall Generation Budget or customer rates. The above expenses account only for activities within the defined scope of the SSA.

5.0 Schedules

5.1 Initial Budgets Summary

(In $000s)

	1		2	3	4
		Schedule Reference	**2023**	**2024**	**2025**
1	**Transmission & Distribution**				
2	**Total Operating Budget**	*5.2*	**$ 547,125**	**$ 480,415**	**$ 409,951**
3					
4	Federally Funded Capital Expenditures[1]	*5.5*	580,733	890,502	1,174,237
5	Non-Federally Funded Capital Expenditures[1]	*5.5*	79,778	155,320	178,283
6	**Total Capital Budget**		**$ 660,511**	**$ 1,045,822**	**$ 1,352,520**
7					
8	**Generation**				
9	Operating and Capital Expenditures[2]	*Appendix D*	245,875	183,805	116,263
10	Shared Services[1,3]	*Section 4.3*	59,748	60,785	61,730
11	**Total Generation Budget**		**$ 305,624**	**$ 244,590**	**$ 177,993**
12					
13	**Other**				
14	LUMA Fees		121,785	93,087	122,666
15	Bad Debts	*5.3*	74,466	95,731	90,162
16	Bankruptcy and Advisor Costs	*5.3*	49,500	63,400	54,600
17	PREPA HoldCo	*5.3*	28,980	20,326	20,642
18	**Total Other**	*5.3*	**$ 274,730**	**$ 272,544**	**$ 288,069**

Notes:

[1] Includes 2% reserve for Excess Expenditures.

[2] PREPA's Certfied FY2023 Genco Budget, as certified on July 1, 2022 and submitted by PREPA to LUMA on July 6, 2022.

[3] Generation Budget includes budgets for services at GencCo currently provided under the Shared Services Agreement.

5.2 Transmission & Distribution Operating Budget

(In $000s)

2023

	1	2	3	4	5	6
				FY23		
		Customer Service	Operations	Utility Transformation	Support Services	2023
	Labor					
1	Salaries, Wages and Benefits	44,815	119,469	29,117	53,070	246,471
2	**Total Labor**	**44,815**	**119,469**	**29,117**	**53,070**	**246,471**
	Non-Labor					
3	Materials & Supplies	329	32,809	1,072	2,475	36,684
4	Transportation, Per Diem, and Mileage	1,039	22,437	2,542	2,285	28,303
5	Property & Casualty Insurance	-	-	-	21,734	21,734
6	Retiree Medical Benefits	-	-	-	-	-
7	Security	-	10	-	9,734	9,744
8	IT Service Agreements	860	818	85	23,310	25,073
9	Utilities & Rents	82	2,973	1,820	5,156	10,032
10	Legal Services	-	-	-	7,150	7,150
11	Communications Expenses	194	59	15	1,094	1,362
12	Professional & Technical Outsourced Services	33,484	14,214	5,550	28,432	81,679
13	Vegetation Management	-	50,000	-	-	50,000
14	Regulation and Environmental Inspection	-	-	-	500	500
15	Other Miscellaneous Expenses	197	13,435	955	3,077	17,665
16	Other Expenses	-	-	-	-	-
17	**Total Non-Labor / Other Operating Expense**	**36,185**	**136,755**	**12,039**	**104,946**	**289,926**
18	**Subtotal Labor and Non-Labor/Other Operating Expenses**	**81,000**	**256,224**	**41,157**	**158,016**	**536,397**
19	Future Efficiencies[1]					-
20	2% Reserve for Excess Expenditures					10,728
21	**Total Operating Budget**	**81,000**	**256,224**	**41,157**	**158,016**	**547,125**

Notes:

[1] Reduction required for 2017 Rate Order Limit with future efficiencies that may be achieved by additional LUMA operational efficiencies and reallocation of ratepayer funds. Refer to Section 2.2 for further information.

[2] Above figures include inflation, as per macro-economic data provided by AAFAF/FOMB January 31, 2022 of 2.7%, 1.7%, and 1.6% in FY2023, FY2024, and FY2025, respectively.

Annual Budgets

Transmission & Distribution Operating Budget

(In $000s)

2024

	1	7	8	9	10	11
				FY24		
		Customer Service	Operations	Utility Transformation	Support Services	2024
	Labor					
1	Salaries, Wages and Benefits	45,592	121,542	29,623	53,991	250,749
2	**Total Labor**	**45,592**	**121,542**	**29,623**	**53,991**	**250,749**
	Non-Labor					
3	Materials & Supplies	335	33,378	1,090	2,518	37,320
4	Transportation, Per Diem, and Mileage	1,057	22,826	2,587	2,324	28,795
5	Property & Casualty Insurance	-	-	-	22,111	22,111
6	Retiree Medical Benefits	-	-	-	-	-
7	Security	-	10	-	9,903	9,913
8	IT Service Agreements	875	832	86	23,715	25,508
9	Utilities & Rents	83	3,025	1,852	5,245	10,206
10	Legal Services	-	-	-	7,274	7,274
11	Communications Expenses	197	60	15	1,113	1,385
12	Professional & Technical Outsourced Services	34,065	14,460	5,646	28,925	83,097
13	Vegetation Management	-	50,868	-	-	50,868
14	Regulation and Environmental Inspection	-	-	-	509	509
15	Other Miscellaneous Expenses	201	13,668	972	3,129	17,970
16	Other Expenses	-	-	-	-	-
17	**Total Non-Labor / Other Operating Expense**	**36,813**	**139,128**	**12,248**	**106,766**	**294,956**
18	**Subtotal Labor and Non-Labor/Other Operating Expenses**	**82,406**	**260,670**	**41,871**	**160,757**	**545,704**
19	Future Efficiencies[1]					(74,709)
20	2% Reserve for Excess Expenditures					9,420
21	**Total Operating Budget**	**82,406**	**260,670**	**41,871**	**160,757**	**480,415**

Notes:

[1] Reduction required for 2017 Rate Order Limit with future efficiencies that may be achieved by additional LUMA operational efficiencies and reallocation of ratepayer funds. Refer to Section 2.2 for further information.

[2] Above figures include inflation, as per macro-economic data provided by AAFAF/FOMB January 31, 2022 of 2.7%, 1.7%, and 1.6% in FY2023, FY2024, and FY2025, respectively.

Annual Budgets

Transmission & Distribution Operating Budget

(In $000s)

2025

	1	13	14	15	16	17
				FY25		
		Customer Service	Operations	Utility Transformation	Support Services	2025
	Labor					
1	Salaries, Wages and Benefits	46,301	123,432	30,083	54,831	254,646
2	**Total Labor**	**46,301**	**123,432**	**30,083**	**54,831**	**254,646**
	Non-Labor					
3	Materials & Supplies	340	33,897	1,107	2,557	37,901
4	Transportation, Per Diem, and Mileage	1,074	23,181	2,627	2,360	29,242
5	Property & Casualty Insurance	-	-	-	22,455	22,455
6	Retiree Medical Benefits	-	-	-	-	-
7	Security	-	10	-	10,057	10,067
8	IT Service Agreements	889	845	88	24,083	25,905
9	Utilities & Rents	85	3,072	1,881	5,327	10,364
10	Legal Services	-	-	-	7,387	7,387
11	Communications Expenses	200	61	15	1,130	1,407
12	Professional & Technical Outsourced Services	34,594	14,685	5,734	29,375	84,388
13	Vegetation Management	-	51,658	-	-	51,658
14	Regulation and Environmental Inspection	-	-	-	517	517
15	Other Miscellaneous Expenses	204	13,881	987	3,178	18,249
16	Other Expenses	-	-	-	-	-
17	**Total Non-Labor / Other Operating Expense**	**37,386**	**141,291**	**12,439**	**108,425**	**299,540**
18	**Subtotal Labor and Non-Labor/Other Operating Expenses**	**83,687**	**264,722**	**42,522**	**163,256**	**554,187**
19	Future Efficiencies[1]					(152,274)
20	2% Reserve for Excess Expenditures					8,038
21	**Total Operating Budget**	**83,687**	**264,722**	**42,522**	**163,256**	**409,951**

Notes:

[1] Reduction required for 2017 Rate Order Limit with future efficiencies that may be achieved by additional LUMA operational efficiencies and reallocation of ratepayer funds. Refer to Section 2.2 for further information.

[2] Above figures include inflation, as per macro-economic data provided by AAFAF/FOMB January 31, 2022 of 2.7%, 1.7%, and 1.6% in FY2023, FY2024, and FY2025, respectively.

5.3 Other

(In $000s)

	1	Notes	2 2023	3 2024	4 2025
1	**Other**				
2	LUMA Fees		121,785	93,087	122,666
3	Bad Debts	1	74,466	95,731	90,162
5	Title III Costs	2	25,100	28,000	25,500
4	PREPA HoldCo Costs	3	28,980	20,326	20,642
6	FOMB Advisor Costs	2	24,400	25,900	19,600
7	P3A Transaction Costs	2	-	9,500	9,500
8	**Total Other**		**274,730**	**272,544**	**288,069**

Notes:

[1] Bad Debts is consistent with the methodology and amounts certified by the FOMB in the 2022 Fiscal Plan.

[2] Bankruptcy and advisor costs are confirmed with FOMB and PREPA and consistent with amounts certified by the FOMB within the 2022 PREPA Fiscal Plan, unless estimates updated by applicable entities

[3] PREPA HoldCo includes an estimate of all ongoing PREPA residual costs, including the direct labor costs of resources retained.

Annual Budgets

5.4 Improvement Portfolios – Summary

(In $000s)

2023

	1	3	4	5	6	7
				FY 2023		
	Portfolio	Federal Funded CapEx	Non-Federal Funded CapEx	OpEx	Total	SRP Total
1	**Customer Experience**	107,343	6,573	21,273	135,189	42,237
11	**Distribution**	151,291	14,575	13,177	179,042	92,068
16	**Transmission**	126,183	100	390	126,673	124,435
21	**Substations**	110,582	22,046	2,105	134,733	112,616
26	**Control Center & Buildings**	45,019	3,679	2,759	51,458	45,043
33	**Enabling**	20,093	21,624	71,327	113,044	103,286
49	**Support Services**	8,835	9,617	83,735	102,186	26,408
68	**Total**	**569,346**	**78,214**	**194,766**	**842,326**	**546,093**

Note:

[1] Total does not include 2% reserve for Excess Expenditures, inflation, or O&M not related to Improvement Programs.

Annual Budgets

Improvement Portfolios – Summary

(In $000s)

2024

		1	9	10	11	12	13
			FY 2024				
	Portfolio		Federal Funded CapEx	Non-Federal Funded CapEx	OpEx	Total	SRP Total
1	**Customer Experience**		70,080	25,245	23,869	119,193	23,525
11	**Distribution**		284,259	21,420	100	305,779	98,030
16	**Transmission**		278,880	100	280	279,260	265,083
21	**Substations**		143,148	28,816	837	172,801	151,519
26	**Control Center & Buildings**		70,280	19,097	1,782	91,159	64,811
33	**Enabling**		7,202	43,587	73,615	124,404	116,365
49	**Support Services**		4,300	11,413	76,235	91,947	16,427
68	**Total**		**858,148**	**149,677**	**176,717**	**1,184,542**	**735,761**

Note:

[1] Total does not include 2% reserve for Excess Expenditures, inflation, or O&M not related to Improvement Programs.

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Improvement Portfolios – Summary

(In $000s)

2025

	1	15	16	17	18	19
		FY 2025				
	Portfolio	Federal Funded CapEx	Non-Federal Funded CapEx	OpEx	Total	SRP Total
1	**Customer Experience**	80,080	27,971	30,919	138,969	25,900
11	**Distribution**	555,219	21,420	100	576,739	108,030
16	**Transmission**	373,733	100	200	374,033	365,986
21	**Substations**	42,332	28,216	837	71,386	50,857
26	**Control Center & Buildings**	52,088	34,911	1,807	88,806	57,143
33	**Enabling**	6,702	43,512	71,651	121,865	99,409
49	**Support Services**	4,100	13,047	74,195	91,341	13,198
68	**Total**	**1,114,255**	**169,176**	**179,708**	**1,463,139**	**720,523**

Note:

[1] Total does not include 2% reserve for Excess Expenditures, inflation, or O&M not related to Improvement Programs.

5.5 Improvement Portfolios – Total Capital Expenditures

(In $000s)

	1	2	3	4	5	6	7	9	10	11
1			Total		=	Fed Funded Contributions		+	Net Non Federally Funded	
2	**Improvement Portfolio**	**2023**	**2024**	**2025**	**2023**	**2024**	**2025**	**2023**	**2024**	**2025**
5	Customer Experience	113,916	95,325	108,051	107,343	70,080	80,080	6,573	25,245	27,971
6	Distribution	165,866	305,679	576,639	151,291	284,259	555,219	14,575	21,420	21,420
8	Transmission	126,283	278,980	373,833	126,183	278,880	373,733	100	100	100
7	Substations	132,628	171,964	70,548	110,582	143,148	42,332	22,046	28,816	28,216
4	Control Center & Buildings	48,698	89,377	86,999	45,019	70,280	52,088	3,679	19,097	34,911
9	Enabling	41,717	50,789	50,214	20,093	7,202	6,702	21,624	43,587	43,512
10	Support Services	18,451	15,712	17,146	8,835	4,300	4,100	9,617	11,413	13,047
11	**Subtotal**	**647,559**	**1,007,825**	**1,283,431**	**569,346**	**858,148**	**1,114,255**	**78,214**	**149,677**	**169,176**
12	**Other**									
13	2% Reserve for Excess Expenditures	12,951	20,506	26,520	11,387	17,461	23,024	1,564	3,045	3,496
14	Inflation[1]	-	17,490	42,569	-	14,893	36,958	-	2,598	5,611
15	**Total Capital Expenditures**	**660,511**	**1,045,822**	**1,352,520**	**580,733**	**890,502**	**1,174,237**	**79,778**	**155,320**	**178,283**

Note:

[1] Inflation as per macro-economic data provided by AAFAF/FOMB January 31, 2022 of 2.7%, 1.7%, and 1.6% in FY2023, FY2024, and FY2025, respectively. FY23 forecast includes 2.7% throughout, while FY24 and FY25 are shown separately on line 14.

5.6 2017 Rate Order Base Rate Revenue Requirement Limit Comparison

(In $000s or otherwise indicated)

	1	2	3	4	5
1		Schedule Reference	**2023**	**2024**	**2025**
2	Forecast Sales (GWh)		*16,510*	*16,212*	*15,222*
3	Projected Sales		1,169,899	1,114,765	1,015,430
4	Other Income		37,358	38,105	38,867
5	Expenditures Limit based on Projected Sales		**1,207,257**	**1,152,870**	**1,054,297**
6					
7	Transmission & Distribution Operating Budget	*5.2*	547,125	555,124	562,225
8	Capital Budget - Non-Federally Funded	*5.5*	79,778	155,320	178,283
9	Future Efficiencies[1]	*5.2*	-	(74,709)	(152,274)
10	Generation Budget[2]	*5.1*	305,624	244,590	177,993
11	Other (LUMA Fees, Bad Debts, PREPA HoldCo, Bankruptcy and Advisor Costs)	*5.3*	274,730	272,544	288,069
12	**Total Non-Federally Funded Transmission & Distribution and Generation Expenditures**		**1,207,257**	**1,152,870**	**1,054,297**
13					
14	Surplus / (Deficit)		-	-	-
15					
16	Total Non-Federally Funded Transmission & Distribution and Generation $/kWh		**$ 0.0731**	**$ 0.0711**	**$ 0.0693**

		2017 Rate Case
17	PREPA Projected Sales (kWh)	17,268,325
18	**PREPA Base Rate Revenue Requirement less Subsidies**	**1,289,098**
19	**PREPA Base Rate Rev Req ($/kWh)**	**$ 0.0747**

Notes:

[1] Reduction required for 2017 Rate Order Limit with future efficiencies that may be achieved by additional LUMA operational efficiencies and reallocation of ratepayer funds. Refer to Section 2.2 for further information.

[2] Generation Budget includes budgets for services at GenCo currently provided under the Shared Services Agreement.

Appendix A: Requirements

The following table provides relevant excerpts related to Budgets from the T&D OMA.

Table A-1. T&D OMA excerpts relevant to Annual Budgets

T&D OMA Excerpt	T&D OMA Reference
"Budget" means each of the Operating Budget, the Capital Budget – Federally Funded, the Capital Budget – Non-Federally Funded and the Generation Budget, and "Budgets" means, collectively, all of them.	Page 4 - Article 1 , Section 1.1
Section 7.3(a) Budgets *(a) Generally. For any Contract Year (other than the initial Contract Year, for which the procedures for the Initial Budgets set forth in Section 4.2(e) (ManagementCo Responsibilities – Initial Budgets) shall apply, or a year in which a rate adjustment approved by PREB enters into effect, in which case the Budgets used in connection with obtaining such rate CONFIDENTIAL 89 adjustment shall be used), Operator shall, no later than ninety (90) days prior to the commencement of such Contract Year, submit to Administrator the proposed Budgets for such Contract Year; provided that if any proposed Budget requires a rate adjustment to be approved by PREB, Operator shall have the right, at its sole discretion, to submit the proposed Budgets for such Contract Year directly to PREB rather than to Administrator. As promptly as practicable in any Contract Year, and sufficiently in advance to allow Operator to comply with the ninety (90) day period set forth above, Owner shall prepare and deliver to Operator the Generation Budget for consolidation with the Operating Budget and the Capital Budgets submitted to Administrator. Administrator shall, acting reasonably, review such proposed Budgets to ensure compliance with the applicable Rate Order and Section 7.4 (Budget Policy). Within forty-five (45) days following its receipt of such Budgets, Administrator shall notify Operator whether the proposed Budgets are compliant with the applicable Rate Order and Section 7.4 (Budget Policy), and shall request, acting reasonably, any changes or modifications to the proposed Budgets to conform the proposed Budgets with the applicable Rate Order and Section 7.4 (Budget Policy). Administrator and Operator shall collaborate in good faith to resolve any differences with respect to such proposed Budgets as promptly as practicable.*	Page 89 - Article 4, Section 7.3
Section 7.3 Budgets. *(b) Flexibility to Overrun. Each Budget shall include up to a maximum of two percent (2%) in excess of the total amount for excess expenditures that may arise in any Contract Year ("Excess Expenditures"); provided that such Excess Expenditures shall at all times be otherwise compliant with the applicable Rate Order. Any Excess Expenditures incurred by Operator during a Contract Year shall be treated as T&D Pass-Through Expenditures and as if initially budgeted for such Contract Year. Each reference herein to a Budget or Default Budget shall be deemed to include such Excess Expenditures to the extent such Excess Expenditures are incurred.*	Page 89 - Article 4, Section 7.3
Section 7.4 Budget Policy. *The Budgets and the related ServCo staffing levels for each Contract Year shall be designed to be adequate in both scope and amounts to reasonably assure that Operator is able to carry out the related O&M Services in accordance with the Contract Standards and have a reasonable opportunity to earn the Incentive Fee for achieving the Performance Metrics. The Parties further acknowledge and agree that, from time to time, it may be necessary or appropriate to amend or otherwise adjust the Performance Metrics or the Budgets as a result of (i) Force Majeure Events, (ii) Owner Fault, (iii) Outage Events or (iv) additional requirements imposed by Owner, Administrator or any other Governmental Body after approval of the Budgets, in the case of each of clauses (i) to (iv), which (A) have resulted (or are reasonably likely to result) in schedule delays or increased work scope or costs and (B) are not attributable to Operator's gross negligence or willful misconduct. Operator shall provide notice to Administrator and PREB promptly following the occurrence of an event contemplated above and the Parties shall, in good faith and acting reasonably, consider necessary adjustments to the Performance Metrics or the Budgets that are based on rates that are reasonable and customary.*	Page 90 - Article 4, Section 7.4

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The following table provides relevant excerpts related to Budgets from the Energy Bureau Resolution & Orders within Initial Budgets docket number NEPR-MI-2021-0004.

Table A-2. Energy Bureau Resolution & Order excerpts relevant to Annual Budgets

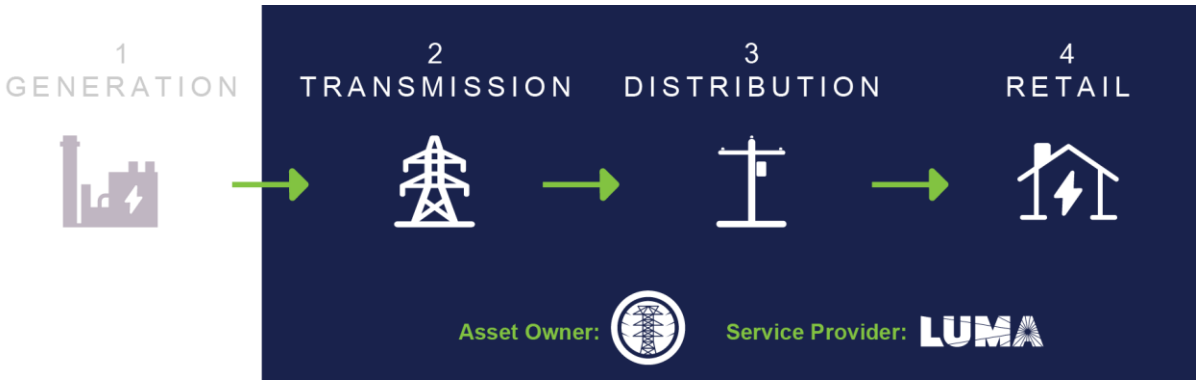
R&O Excerpt	R&O Reference
The Energy Bureau REJECTS LUMA's proposal and ORDERS LUMA to submit its proposed FY2023 budget on or before April 1, 2022.	Section 1 of the July 16, 2021 Resolution & Order
Under the May 31 Resolution, the Energy Bureau here expands upon the filing requirements to be complied with by LUMA in its FY 2023 Annual Budgets Filing. *Filing requirements are imposed by law and Energy Bureau orders. All applicable provisions of law and regulation remain in effect whether or not specified in this Resolution and Order and must be complied by LUMA.* *The Energy Bureau REQUIRES LUMA to include in its filing, all applicable workpapers and supporting material used to develop its Fiscal Year 2023 budget proposal. In this respect, Attachment A of the Energy Bureau's April 5 Order15 should be complied with, unless inapplicable due to specific references to the proposed Initial Budgets or changed circumstances. The Energy Bureau expects LUMA to make this determination being more rather than less inclusive.* *Because the Energy Bureau's April 5 Resolution preceded LUMA's Modification Request, in which LUMA requested approval of Initial Budgets it had modified to conform with FOMB's FY 2022 Budget Certification, LUMA should clearly delineate its proposed Fiscal Year 2023 budget correlation with the FOMB figures and provide adequate supporting material.*	March 25, 2022 Resolution & Order

Appendix B: Structures, Roles and Organization Chart

B.1 LUMA Role as Regulated Operator

LUMA manages all functions from when the electricity leaves the generation facilities and enters the T&D grid to delivering electricity and providing energy service to retail customers, including system planning and dispatch.

Figure B-1. LUMA responsibilities



B.2 T&D OMA and Regulatory Structure

The following graphic displays the entities involved in the T&D OMA or that have a key role in oversight of LUMA's activities.

Figure B-2. T&D OMA and Regulatory Structure



Note: P3 process for private operator for PREPA Legacy Generation expected to have similar structure

B.3 LUMA Organization Chart

Figure B-3. LUMA Organization Chart



Appendix C: Improvement Portfolios

LUMA's programs have been organized into portfolios of similar, interdependent programs that together cover all functional areas of the utility. Table C-1 below provides a summary of annual spending estimates for each portfolio, from Fiscal Year 2023-2025. These estimates include federally funded programs, non-federally funded capital expenditures and program-related operational expenditures.

Table C-1. Annual Spending Estimates for Each Portfolio ($ million, real)

Portfolio	FY2023				FY2024	FY2025
	Federal Funded Capital	Non-Federal Funded Capital	OpEx	Total Spending Estimate	Total Spending Estimate	Total Spending Estimate
Customer Experience	107	7	21	135	119	139
Distribution	151	15	13	179	306	577
Transmission	126	0	0	127	279	374
Substations	111	22	2	135	173	71
Control Center and Buildings	45	4	3	51	91	89
Enabling	20	22	71	113	124	122
Support Services	9	10	84	102	92	91
Grand Total	**569**	**78**	**195**	**842**	**1,185**	**1,463**

Customer Experience will continue to be enhanced in multiple ways. The streetlight repair program will continue to progress by assessing, planning, and executing repair work across the island. Streetlighting will be physically accounted for and updated with a unique identifier tag. The Modernize Customer Service Technology program has reached remediated state and this will enable our Customer Experience team to continue implementing improvements and allow us to continue to serve our customers better.

Distribution and **transmission** assets damaged by Hurricanes Irma and Maria that received temporary emergency repairs to quickly restore service will receive permanent repairs. Assets such as towers, poles, lines, anchors and guy-wires will all be repaired, restored to current standards and hardened to increase resiliency where possible. New technology and capital investments will automate distribution and increase transmission reliability. The telecommunication system will be restored and modernized as improvements continue to be made.

Substations will be repaired, rebuilt and made safer and more reliable, while increasing mitigation against future disasters. Physical security at substations will be improved through repairing fences and lighting, replacing padlocks, and installing new signage. Grounding of substations will be improved to

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safeguard public, LUMA personnel, and ensure proper equipment operation. Substation technologies will be upgraded to allow for fast, secure protection and control systems with advanced diagnostics, event reporting, and self monitoring systems.

Control centers, which are critical for the delivery of economic and reliable energy, will be refurbished or completely rebuilt. They will continue to receive critical software upgrades and new technical capabilities that allow for improved energy management and balancing the supply and the demand. New system operating procedures and strategies will be developed alongside the physical, software and technological upgrades. Buildings such as warehouses and mechanic shops will be remediated for damages by natural disasters, with security improved at facilities.

The **Enabling** portfolio establishes the necessary infrastructure and systems to enable the successful execution of operational and capital work. The portfolio of investment programs focuses on safety, technical training and operational excellence. Investment programs include the ongoing provision of PPE and tools (as well as provisions for their inventory and management), training in skills and safety for all employees, continued enhancements to the PMO specifically designed to handle large capital projects and new data systems to accurately store and utilize data on T&D assets gathered through assessments.

Support services is cross functional. They include human resource programs for attracting and retaining a high performing employee base, and processes and tools to secure information resources while permitting appropriate access to authorized stakeholders from all times and from any location. This portfolio also includes regulatory studies and plans that inform the development of an IRP and roadmap and emergency response preparedness which is particularly important for Puerto Rico.

The remainder of this section presents a brief description of each portfolio, along with their associated programs. For Portfolio Capital Expenditures included in the Capital Budget, please refer to Schedule 5.4 Improvement Portfolios – Summary as well as Schedule 5.5 Improvement Portfolios – Total Capital Expenditures.

Since LUMA took over operations of the T&D System on June 1, 2021, substantial efforts have been made prepare for the execution and to execute improvement programs across the organization. Through those efforts LUMA has learned about the system, the organization, the planned activities and has developed a deeper understanding of the requirements to implement our improvement programs. Taking what we have learned since June 1, we have refined and updated our improvement programs to reflect those learnings and enhance each of our programs. In some cases, that refinement looks like updates to the budget or the timeline and in a few cases we took a look at updating the scope of our improvement programs if required. Where programs have been completed in their entirety or the scope has been consolidated into another program, the briefs for those programs no longer exist.

In four instances, we have consolidated improvement programs to more accurately reflect the way we are carrying out the work, to enable organizational consistency during execution of activities and align with the way our federal funding project groupings. The activities within the improvement programs have not changed, they have just been consolidated. Those consolidations are reflected in the Substation and the Enabling portfolios within the following 4 programs:

- Substation Rebuilds (Combining Transmission Substation Rebuilds, Distribution Substation Rebuild, and Transmission Substation T&G Demarcation)

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- Substation Reliability (Combining Transmission Substation Reliability Improvements and Distribution Substation Reliability Improvements)
- Substation Security (Combining Physical Security for Distribution Facilities and Transmission Substation Security)
- Compliance & Studies, Technology & Performance (Combining Compliance and Studies, Distribution Technology, Technology Monitoring Systems, and Performance Metrics Process & System Upgrades)

Table C-2 below outlines the updates and refinements that have been made to each improvement program including: identifying any new gaps and activities, updating budget and milestones and the rationale behind these refinements. Note that a check mark in the table below indicates that the corresponding portion of the improvement program brief has been updated.

Table C-2. Improvement Program Changes for FY 2023

Improvement Program	Updated Gaps or Activities	Updated Budget	Updated Milestones	Description of Changes and Rationale
Customer Experience				
Distribution Streetlighting		✓	✓	Annual budget has been updated. Milestones have been updated to reflect the approached used to manage the work.
Billing Accuracy & Back Office		✓	✓	Annual budget has been updated. Delay in remediated state due to increase in anticipated scope of work.
Loss Recovery Program		✓		Annual budget has been updated.
Distribution Meter Replacement & Maintenance		✓		Annual budget has been updated.
Standardized Metering & Meter Shop Setup		✓		Annual budget has been update.
Modernize Customer Service Technology		✓		Annual budget has been update.
Streetlight Billing		✓	✓	Annual budget has been updated. Milestones have been delayed because streetlight data collection is a pre-requisite for this program to continue with activities.
Voice of the Customer		✓		Annual budget has been updated.
AMI Implementation Program		✓		Annual budget has been updated.
Distribution				
Distribution Automation		✓		Annual budget has been updated.
Distribution Line Rebuild		✓		Annual budget has been updated.

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Improvement Program	Updated Gaps or Activities	Updated Budget	Updated Milestones	Description of Changes and Rationale
Distribution Lines Assessment		✓	✓	Annual budget has been updated. Milestones have been updated to reflect the time required to complete the work.
Distribution Pole and Conductor Repair		✓	✓	Annual budget has been updated. Milestones have been updated to reflect the time required to complete the work.
Transmission				
Transmission Line Rebuild		✓	✓	Annual budget has been updated. Milestones have been updated to reflect the delay in obtaining federal funds.
IT OT Telecom Systems & Network	✓	✓	✓	Annual budget has been updated. Milestones have been updated to reflect the delay in obtaining federal funds.
Transmission Priority Pole Replacements		✓	✓	Annual budget has been updated. Milestones have been updated to reflect the time required to complete the work.
Assessment of Transmission Lines		✓		Annual budget has been updated.
Substations				
Substation Rebuilds	✓	✓	✓	This brief has been consolidated and includes the following programs from the FY 2022 filing: ▪ Transmission Substation Rebuilds ▪ Distribution Substation Rebuild ▪ Transmission Substation T&G Demarcation These briefs have been consolidated to reflect how we group our work to optimize federal funding opportunities and to take advantage of efficiencies by conducting activities at the same time under the same projects and program. The entire program has been updated.
Substation Security		✓	✓	This brief has been consolidated and includes the following program from the FY 2022 filing: • Physical Security for Distribution Facilities • Transmission Substation Security The brief was consolidated to optimized federal funding opportunities and to take advantage of efficiencies by conducting activities at the same time under the same projects and program. Annual budget has been updated. Milestones have been updated to align with the most current estimated timelines associated with obtaining federal funding.

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Improvement Program	Updated Gaps or Activities	Updated Budget	Updated Milestones	Description of Changes and Rationale
Substation Reliability	✓	✓	✓	This brief has been consolidated and includes the following programs from the FY 2022 filing: ▪ Transmission Substation Reliability Improvements ▪ Distribution Substation Reliability Improvements These briefs have been consolidated to reflect how we group our work to optimize federal funding opportunities and to take advantage of efficiencies by conducting activities at the same time under the same projects and program. The entire program has been updated.
Regional and Technical Facilities Security		✓		Annual budget has been updated.
Control Center & Buildings				
Critical Energy Management System Upgrades		✓		Annual budget has been updated.
Facilities Development & Implementation		✓	✓	Annual budget has been updated. Milestones have been updated to align with the most current estimated timelines associated with obtaining federal funding.
Control Center Construction & Refurbishment		✓		Annual budget has been updated.
Warehouse Security		✓		Annual budget has been updated.
Critical Energy Management & Load Generation Balancing		✓		Annual budget has been updated.
Critical System Operation Strategy and Processes		✓		Annual budget has been updated.
Enabling				
Vegetation Management	✓	✓	✓	Additional activities have been included in the brief to more accurately reflect the Vegetation Management work that LUMA will be conducting as part of this improvement program. Annual budget has been updated. The milestones have been refined to align with the work that needs to be completed.

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Improvement Program	Updated Gaps or Activities	Updated Budget	Updated Milestones	Description of Changes and Rationale
Compliance & Studies, Technology & Performance	✓	✓	✓	This brief has been consolidated and includes the following programs from the FY 2022 filing: ▪ Compliance and Studies ▪ Distribution Technology ▪ Technology Monitoring Systems ▪ Performance Metrics Process & System Upgrades These briefs have been consolidated to reflect how we group our work to optimize federal funding opportunities and to take advantage of efficiencies by conducting activities at the same time under the same projects and program. The entire program has been updated.
HSEQ and Technical Training		✓		Annual budget has been updated.
T&D Fleet		✓	✓	Annual budget has been updated. Reduction in total vehicle count due to exclusion of GenCo and HoldCo vehicles from scope of program. Realignment of vehicles counts to new categories descriptions. Delay in remediated state due to higher number of unusable vehicles than originally anticipated.
Tools Repair & Management		✓		Annual budget has been updated.
Asset Data Integrity		✓		Annual budget has been updated.
Permits Processes & Management	✓	✓		Annual budget has been updated. Additional gaps and activities identified since June 1 have been included.
Workflow Processes & Tracking		✓		Annual budget has been updated.
Material Management		✓		Annual budget has been updated.
Project Management Software and Tools		✓		Annual budget has been updated.
Operator Training		✓		Annual budget has been updated.
Construction & Commisioning Management Office		✓		Annual budget has been updated.
Emergency Response Preparedness		✓		Annual budget has been updated.
Project Controls, Risk Management & Estimating Offices		✓		Annual budget has been updated.

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Improvement Program	Updated Gaps or Activities	Updated Budget	Updated Milestones	Description of Changes and Rationale
Capital Programs, PMO & Funding Management Office Setup		✓		Annual budget has been updated.
Support Services				
Human Resources (HR) Programs		✓		Annual budget has been updated.
Renewables Integration Studies & Implementation	✓	✓		Annual budget has been updated. This program's scope has been updated to reflect the implementation activities associated with this work.
IT OT Asset Management		✓		Annual budget has been updated.
Update to Third Party Use, Audit, Contract and Billing Procedures		✓	✓	Annual budget has been updated. Milestones have been delayed because streetlight data collection is a pre-requisite for this program to continue with activities.
IT OT Cyber Security Program		✓		Annual budget has been updated.
IT OT Enablement Program		✓		Annual budget has been updated.
Critical Financial Controls		✓	✓	Annual budget has been updated. Milestones have been refined to reflect the most current estimated timeline.
Critical Financial Systems		✓		Annual budget has been updated.
Land Records Management		✓		Annual budget has been updated.
Resource Planning and Processes to Improve Reliability and Cost Tracking		✓		Annual budget has been updated.
Improvements to Systems Dispatch for Increased Reliability and Resiliency		✓		Annual budget has been updated.
Land Acquisitions & Dispute Management	✓	✓		Annual budget has been updated. Additional gaps and activities identified since June 1 have been included.
Financial Management Functions		✓		Annual budget has been updated.
Waste Management		✓		Annual budget has been updated.
IT OT Collaboration & Analytics		✓		Annual budget has been updated.

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Improvement Program	Updated Gaps or Activities	Updated Budget	Updated Milestones	Description of Changes and Rationale
Integrated Safety & Operational Management System		✓		Annual budget has been updated.
Safety Equipment		✓		Annual budget has been updated.
Public Safety Program		✓		Annual budget has been updated.

C.1 Customer Experience Portfolio

Customer Experience will be enhanced in multiple ways. LUMA's VoC program and the deployment of enhanced customer service technology will improve interactions with customers. Streetlighting will be repaired and billing systems improved. Distribution meter replacement and maintenance and a standardized meter shop will improve customer billing and reduce meter visits. Table C-3 below presents a summary of the program spending for the largest programs in the customer experience portfolio, followed by a short description of each Program.

Table C-3. Customer Experience Portfolio Spending Estimates by Program ($ million, real)

	FY2023				FY2024	FY2025
Customer Experience Programs	**Federal Funded Capital**	**Non-Federal Funded Capital**	**OpEx**	**Total Spend Estimate**	**Total Spending Estimate**	**Total Spending Estimate**
Distribution Streetlighting	105	-	-	105	70	80
Billing Accuracy and Back Office	-	1	12	13	12	11
Loss Recovery Program	-	-	5	5	8	16
Distribution Meter Replacement & Maintenance	2	1	1	4	22	22
Standardized Metering and Meter Shop Setup	-	4	1	4	4	7
Modernize Customer Service Technology	-	2	1	3	2	3
Streetlight Billing	-	-	1	1	1	-
Voice of the Customer	-	0	1	1	1	1
AMI Implementation Program	-	-	-	-	0	-
Grand Total	**107**	**7**	**21**	**135**	**119**	**139**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

Distribution Streetlighting. This program deals with upgrading and replacing distribution streetlights that are a physical safety hazard and are scheduled for repair or replacement based on their criticality. Along with increasing the number of distribution streetlights in service, this process will also include LED replacements and GIS data entry of all streetlights.

Billing Accuracy and Back Office. This program includes updates to bill print and delivery and other back office systems to ensure LUMA has the ability to continue to produce customer invoices. Current technology, machines and systems are outdated, creating a financial liability in delayed revenue of ~$12.5 million for each day invoices are not produced. This upgrade includes acquisition of new hardware and software to support billing and customer contracts, along with removing redundant bill printing and enveloping equipment. Additionally, the program supports back-office processing of service order paperwork and mobilizes resources to address backlogs of estimated and unbilled accounts. The

program also implements a customer experience metrics dashboard and agent routing technology for Billing Services to reduce resolution time and increase customer satisfaction.

Loss Recovery Program. This program is targeted at reducing NTLs by the application of advanced monitoring and software techniques coupled with a significant number of inspection teams in the field. Initiatives include AMI revenue protection software and modules that can identify anomalies in equipment and customer consumption, enhanced data analytics, field theft detection tools and widespread inspections, all supported by a team of new back office business and data analysts.

Distribution Meter Replacement and Maintenance. This program deals with correction, replacement and maintenance of distribution meters. In particular, the program will replace failed Two-Way Automatic Communication System (TWACS) meters, along with maintenance items related to improving communications within the existing TWACS system.

Standardized Metering and Meter Shop Set Up. This program is targeted at establishing a location for standardized meter testing for LUMA and the provision of appropriate internal and external meter testing equipment. Enhanced procedures are also included, along with operational support for the new facility and equipment.

Modernize Customer Service Technology. The Modernize Customer Service Technology program is primarily focused on remediating the telephone technology through the development and implementation of LUMA's cloud-based contact center platform. Contact center software allows for the management of a high volume of inbound and outbound customer communications across a range of channels. Modernizing contact center and associated procedures will further mitigate LUMA's risk of customers being unable to report emergency situations. The program will create real time dashboards and reporting to cover key performance indicators across all of Customer Experience, including the contact center, district offices and billing services.

Streetlight Billing. This program is an audit of streetlights and associated billing. PREPA has approximately 500,000 streetlights, which should be audited on a regular cycle to be determined based on asset management procedures. This program will require LUMA to complete a physical audit of the streetlights, assigning each with a unique indicator/asset tag. Once this process is complete, updates will be made in the CC&B system to ensure customers are being billed accurately for their lights. The program also includes communication with customers on corrections to the street lighting system

Voice of the Customer. This program focuses on customer service, providing customers with increased voice, and improving tracking of customer service interactions. Quality assurance mechanisms implemented under this program include customer surveys, welcome packs, customer center voice and screen recording and customer complaint tracking and case management. The program also includes process and communications improvements such as quantitative analysis of Key Performance Indicators (KPIs) and other metrics to improve overall customer service, along with customer experience training for employees.

AMI Implementation Program. An AMI implementation program establishes two-way remote meter reading reporting and control capabilities. Such programs enable a broad range of capabilities that result in cost savings to the utility and customer satisfaction improvements. This is achieved by providing the ability to offer more granular consumption data, bi-direction metering, outage notifications, power quality measurements and remote connects / disconnects. For the utility, operational savings and revenue

protection are critical drivers as well as OMS, DR, Data Aggregation (DA), load forecasting, load research, rate studies and many other critical modern utility functions. An AMI program is usually seen as a top priority foundational program due it its large number of related and dependent programs and the savings and customer benefits that are immediately available.

Distribution Streetlighting

1.0 Program Description

This program deals with upgrading and replacing distribution streetlights that are a physical safety hazard and are scheduled for repair or replacement based on their criticality. Along with increasing the number of distribution streetlights in service, this process will also include LED replacements and GIS data entry of all streetlights.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

As a result of natural disasters including hurricanes and earthquakes, an estimated 70% of the ~ 500,000 streetlights in Puerto Rico are damaged. Many of these damaged streetlights (estimated at ~343,000) require repair, replacement, or upgrade. As per Puerto Rico Energy Public Policy Law No. 17 (April 11, 2019), all existing high-pressure sodium (HPS) lamps must be replaced with LEDs by 2030. All streetlights also require data entry into the GIS system (per local rules), properly grounded and potential underground feeding them repaired with a longer term need to evaluate and plan implementation of a smart streetlighting system. The OMA also requires that public lighting be maintained and improved and that the operations and maintenance of these lights, including installation of LED lighting, be in accordance with Prudent Utility Practice and applicable law.

Of the 70% damaged streetlights, LUMA estimates that approximately 15 percent of the distribution streetlights are a physical safety hazard that require hazard mitigation to reach remediation. Field assessments will categorize assets according to their health, based on estimates of condition (likelihood of failure) and criticality (consequence of failure) and will assign an asset score from 0 (worst) to 4 (best). Mitigation of risk related to only the highest risk assets will be categorized as a 0 or 1 and performed as SRP work. These deficient assets will exhibit the following:

- Extreme likelihood of failure, or already failed, *and* likely to cause:
  - A safety impact to the workers or the public, and/or
  - Failure to meet applicable legal requirements, including Act 17, which includes requirements related to safe and reliable utility operations.

For the reasons mentioned above this program is included in the SRP.

All deficient assets, including those in the SRP will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

Distribution Streetlighting

2.2 Description of Remediated State

Field assessments will be performed under a separate program (field assessment's program). High risk findings (asset score of 0 and 1) shall be incorporated into a remediation plan within 60 days of identification. That plan shall take into account a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

In the remediated state, the following will be accomplished:

- High level assessment of distribution streetlight assets
- Repair/replacement of approximately 15% distribution streetlight assets that have a high likelihood of failure with a potential to cause damage to public infrastructure or injury to the public

2.3 Description of Program Completed State

In the completed state, all ~343,000 damaged lights will have been repaired, replaced or upgraded over a period of 10 years. Within six years from project outset, all 490,000 lights would also have been entered and monitored through LUMA's GIS system.

Additionally, as part of the completed state, all HPS lamps would have been replaced by LEDs by 2030. Finally, evaluation of a smart streetlight system would also have been completed.

2.4 Program Activities

- Completion of field audit to locate lights and entered asset management database
- Establishing plan for replacing lights from a geographic and type of light perspective including evaluation for smart streetlighting
- Issuing RFPs for replacement of the lights
- Selecting vendors/contractors to complete the work

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Direct
☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	

Distribution Streetlighting

	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☒ Restore Damaged Grid Infrastructure	Direct
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Indirect
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

This program improves public safety as failed lights can increase public safety and security risks.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Deliver Electricity at Reasonable Prices

This program enables a more positive customer experience by restoring streetlights to working order. This also supports proper billing for them, which results in electric consumption being fairly charged to light owners. Re-establishing revenue from the lights can also postpone or reduce future rate increases for customers.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

This program falls directly within one of the targeted federal FEMA funding areas.

Objective: Restore Damaged Grid Infrastructure

This program replaces lights that are no longer working due to storm damage or wear out.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid

Smart streetlighting would satisfy a key component of modernizing the grid, offering the following main benefits:

Distribution Streetlighting

- Contains sensors that adjust their brightness and achieve significant reduction of energy consumed by dimming each individual fixture where no traffic is present, and also by adaptively adjusting its brightness based on the light sensed (as opposed to on/off only)
- Applies a management system that allows for remote monitoring and control of streetlights, enabling detection of failures and maloperation, and somewhat futuristic, but in use elsewhere
- Incorporates a variety of other functions ranging from containing a level-1 120V vehicle charger, to monitoring the availability of parking and can even sense mischief (e.g., sense the noise of broken glass and initiate an automatic reporting system)

2.6 Program Risks

The risks of not moving forward within this program include:

- Failure to address public safety/security risks due to non-functioning lights
- Failure to deliver a positive customer experience and deliver safe, reliable electricity at reasonable prices
- Reputational risk to LUMA for not delivering a key service
- Being in non-compliance with Puerto Rico Energy Public Policy Law No. 17, which requires replacement of all HPS lamps with LEDs by 2030

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$105.0**	**$70.0**	**$80.0**	**$852.9**
SRP Expenditures	$31.5	$21.0	$24.0	$240.7

3.2 Program Resource Requirements

- Approximately 343,000 LED lights and associated installation hardware
- Adequate internal resources to complete the light field audit and enter GIS data
- Adequate internal and external resources/contractors to carry out the light replacements

3.3 Estimating Methods & Assumptions

The average cost for field audits/GIS entry and light replacements based on past experiences with similar projects.

For field audit/GIS Data:

- REDACTED
- 50% are joint use with the utility pole program and will be handled with pole GIS data entry. Cost estimates reduced by 50% as a result
- After project compression, project total = $3.96M spread over 5 years ($792k/yr.)

For light replacements:

Distribution Streetlighting

- REDACTED

3.4 SRP Program Timeline & Milestones



Billing Accuracy & Back Office

1.0 Program Description

This program includes updates to bill print and delivery and other back-office systems to ensure LUMA has the ability to continue to produce customer invoices. Current technology, machines and systems are outdated, creating a financial liability in delayed revenue of ~$12.5M for each day invoices are not produced. This upgrade includes acquisition of new hardware and software to support billing and customer contracts, along with removing redundant bill printing and enveloping equipment. Additionally, the program supports back-office processing of service order paperwork and mobilizes resources to address backlogs of estimated and unbilled accounts. The program also implements a customer experience metrics dashboard and agent routing technology for Billing Services to reduce resolution time and increase customer satisfaction.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Discussion throughout this program brief will be separated by different projects under this program, e.g., Bill Print and Delivery Outsourcing, Remove Redundant Bill Printing and Enveloping Equipment, etc.

BILL PRINT & DELIVERY OUTSOURCING

For hard copy bills, PREPA currently generates and prints customer bills using an in-house Bill Print & Delivery (BP&D) function, located at its main office building (NEOS). Most bills are issued automatically using the Oracle CC&M platform (v2.7) along with other key IT systems (e.g., Control M, Doc1, Streamweaver, etc.). As part of this in-house function, PREPA manages the process for handling any returned mail (e.g., marked as undeliverable by the US Postal Service). The Bill Print & Delivery function is costly (~$8.5M/yr.) and exposes PREPA to unnecessary risks as it relies on outdated bill printing/enveloping machinery (InfoPrint 4000) and uses unsupported IT software (Doc1). PREPA has no current BP&D emergency backup plan in place (e.g., in the event of a major disaster at NEOS). There is an opportunity to outsource the BP&D function, thereby reducing cost and risk.

REMOVE REDUNDANT BILL PRINTING & ENVELOPING EQUIPMENT

The BP&D function relies on key assets including bill print & enveloping machinery as well as key technology and software platforms. The machinery includes two bill printing machines (InfoPrint 4000 machines) and three enveloping machines (FPS14, RD3W, RD3N). This machinery is old and near the end of its productive life. The base software platform to store customer billing and usage data is Oracle's CC&B platform (V2.7; recently upgraded in Q2/Q3 2020). The following software is also used to control the BP&D function: Control-M (batch scheduling), Doc1 (bill composition/rendering), Streamweaver (bill file separation), E2Vault (indexes/ prepares files for rendering) and Linux SMTP servers (eBill notifications). The Doc1 platform is currently unsupported by the vendor which creates risks for PREPA's Bill Print & Delivery function.

Billing Accuracy & Back Office

USE RESOURCES FOR BACK OFFICE PROCESSING OF SERVICE ORDER PAPERWORK AND MANUAL DATA ENTRY/UPDATE OF CC&B

Currently, service order field work is distributed manually (using paper) to PREPA's field teams on a decentralized basis. Upon completion of service orders, field teams will return completed paperwork to physical locations to be manually entered into systems of record (e.g., CC&B, CUCOH, etc.). Examples of service order work include:

- Cut-off for non-payment orders (current PREPA past due and eligible for cut-off accounts customers >100k)
- Claims-related field work (12-15k meter investigations / exchanges per year)
- Consumption on active meters without an account (~5K backlog)
- Theft orders (~30K meter investigations conducted per year)

The lack of a digital workforce management solution is a major gap for the effective and efficient completion of quality work and also inhibits the timely and accurate recording of work for PREPA (e.g., due to manually data entry errors). Short-term and long-term solutions may be needed to achieve gains in efficiency, quality and costs savings that drive long-term value for PREPA and its customers. In the short-term, solutions may include process redesign, labor, use of technology (scanners, fax, etc.) and/or other digital solutions to minimize paper processing and manual data entry. In the long-term, solutions may include implementation of a digital workforce management solution which will distribute service orders to field teams on an automated basis.

USE RESOURCES TO WORK DOWN OF ESTIMATED, UNBILLED, & OTHER BILLING EXCEPTION-RELATED ACCOUNTS

"Billing exceptions" are defined as customer bills that are unable to be automatically issued / printed via the Oracle CC&B platform due to a breakdown or error in the process, or a bill objected to by customers known as a "Claim". PREPA manages several types of billing exceptions including (backlog amount listed in parentheses):

- unbilled accounts (~$9k)
- estimated bills (~$143k)
- billing error ($TBD-request for backlog made)
- consumption on active meter without account (~$5k), and
- claims (no backlog; ~$12k claims/year)

In addition, it is believed that there are a significant number of streetlights and joint use assets which are not accurately tracked in the asset management and/or billing systems and therefore, are not being billed appropriately.

CUSTOMER EXPERIENCE METRICS DASHBOARDS

As part of the review of documents shared by PREPA, and through key stakeholder interviews conducted in the functional areas of billing, payments, credit & collections and theft, the team has not identified a set of holistic performance metrics and management meetings designed to drive performance at PREPA. PREPA's limited metrics are scattered across many documents. In addition, there are limited performance management meetings, but it is unclear how effective they are in driving performance. No corrective action plans were identified to drive performance (although on a case-by-case basis one-off initiatives were identified).

Billing Accuracy & Back Office

AGENT WORK ROUTING TECHNOLOGY FOR BACK OFFICE (WORK QUEUE ASSIGNMENT)

Billing exception work (unbilled accounts, estimated bills, etc.) is managed on a partially manual basis by extracting information from CC&B and into reports (e.g., some reports are in Excel or within the True North Dashboard). Improved routing of work to back office agents will improve workforce management and productivity yielding operational improvements for the back office.

GENERAL TECHNOLOGY BILLING

There are other technology gaps within the current billing solution that will be addressed as part of this program (e.g., loose error controls within Oracle CC&B). Within the scope of this program, the team will further evaluate market available CC&B solutions and their fit against LUMA's business requirements, technology requirements, cost and vendor services to implement recommended solutions and required integrations. This program will also decommission the on premise Aclara Meter Data Management (MDM) solution.

Other technology gaps exist relating to billing for key areas including joint use and high load moves. Investments are needed to achieve Payment Card Industry (PCI) compliance related to payments as well as work areas related to theft management and credit & collections. Finally, scanning technology will help support the manual service order dispatch and return process.

This program supports the necessary investments needed to close these gaps.

2.1.1 Additional Gaps Identified Post-Commencement

Upon commencement of operations of the billing and payments functions additional gaps and expansiveness of the known gaps became clear.

OPERATIONAL REPORTING

Standard operating reports for workforce management, system performance and task completion on daily, weekly or monthly basis are either non-existent, insufficient, unavailable due to data connectivity issues or are questionable in their accuracy.

Additional reporting and repair of existing reporting must be addressed to reach a remediated state.

BILLING ACCURACY REVIEW AUTOMATION AND PROCESSING

Limited to no industry standard bill segment automate quality and error evaluation algorithms or programming. This gap currently impacts unbilled and estimated accounts. Further, the loss reduction of underbilled accounts is significant. Post commencement it became clear that non-standard configuration and programming of the billing system result in underbilled accounts. A lack of controls on user functions further results in underbilling. Programming changes are necessary to limit user roles and to create evaluations and enable issue detection and correction in a controlled and automated process.

Programming changes are also necessary for billing adjustments and bill presentment to enable accurate and clear reflection of the adjustment on customers' bills.

Billing Accuracy & Back Office

2.2 Description of Remediated State

In the remediated state, the following will have been implemented in accordance with billing requirements as outlined under Act 17, Act 57, and Annex I of the OMA:

- BP&D function outsourced to and being performed by a third-party vendor reducing risk and improving customer experience
- A significant reduction of billing exception backlogs (e.g., unbilled accounts, estimated bills, etc.)
- Centralization of back office operations for improved billing exception management and the optimization of the dispatch, return and data entry of field services orders into systems of record
- Improve reporting to identify gaps and make improvements for the bill print & delivery function, billing exception management, payment processing and theft identification/deterrence

2.2.1 Additional Remediated State Description Identified Post-Commencement

- Optimization of Customer Care & Billing system to include controls, mitigation of user manipulation of key billing components (meter reads, unauthorized rate changes, etc.), minimization of risk of revenue loss due to under billing and appropriate fiscal controls and reporting for business operations and management
- Implemented configuration and programming to reduce volume of manual tasks that result in higher volumes of errors
- Implementation of appropriate roles to enable the ability to route workflows and tasks through centralized and specialized groups (Billing, Energy Irregularities, Revenue Protection)
- Accurately rebuild broken and/or insufficient operational reports and build out standard utility daily, weekly, monthly operational reports that are non-existent

2.3 Description of Program Completed State

BILL PRINT & DELIVERY OUTSOURCING

When the BP&D function is outsourced, the outsourced third party vendor will provide a comprehensive solution to print, batch, render, sort (hard copy printed bills and electronic bills), store images, enable bill image access, etc. The vendor will also be expected to provide address standardization and returned mail services. Finally, the vendor will have a disaster mitigation and disaster recovery plan to manage disaster-related risk.

REMOVE REDUNDANT BILL PRINTING & ENVELOPING EQUIPMENT

After the BP&D function is outsourced, the existing in-house bill printing and enveloping machines will need to be removed and the current space (NEOS, 1st floor) will need to be remodeled for reuse.

USE RESOURCES FOR BACK OFFICE PROCESSING OF SERVICE ORDER PAPERWORK AND MANUAL DATA ENTRY/UPDATE OF CC&B

Currently, service order field work is distributed manually (using paper) to PREPA's field teams on a decentralized basis. In the completed state, the back-office service order work will be centrally dispatched (and completed service order notes/details will be returned to the centralized back office).

Resources will be used to generate service order lists across many services order types and to prepare them for LUMA field teams for completion. Upon completion of the work by LUMA field teams, a process will be used by the back office to support field returns of completed service orders (with notes) to be

Billing Accuracy & Back Office

manually entered by the resources in an appropriate system of records (e.g., CC&B). This short-term process will be used until the long-term digital solution can be implemented to reduce manual labor-intensive processes and paperwork.

USE RESOURCES TO COMPLETE BACKLOG OF ESTIMATED, UNBILLED, & OTHER BILLING EXCEPTION-RELATED ACCOUNTS

Significant billing-related backlogs exist at PREPA (e.g., estimated bills, unbilled residential/commercial accounts, unbilled streetlight accounts, etc.). For example, the estimated bill backlog is ~143k or ~10% of 1.47m PREPA customers. Typical estimated bills as a percentage of total customers at well functioning utilities range from 1-2% (a gap of 8-9% exists to be closed).

To close the gap and bring the backlog in line with well-functioning utilities, additional resources will be used to understand root cause drivers, revise/develop key processes, and work-down the backlogs.

CUSTOMER EXPERIENCE METRICS DASHBOARDS

In the completed state, the dashboard will deliver a complete set of metrics prioritized and linked to business objectives and ultimately drive effective performance management for these functional areas. Enhancing the dashboard with metrics for these areas would provide transparency into performance (e.g., YTD actuals vs. monthly / annual targets) and drive focus on identified gaps for development of performance improvement plans (e.g., based on prioritized initiatives with defined scope, timing, cost and responsible parties).

AGENT WORK ROUTING TECHNOLOGY FOR BACK OFFICE (WORK QUEUE ASSIGNMENT)

Currently, billing exceptions (estimates and unbilled accounts) are managed by extracting information from CC&B into reports. While the current reports provide insights into monthly totals and trends, they do not provide visibility into intra-day/month volumes for more effective management of backlogs.

A workforce management solution for back-office work will enable improved work management and increased workforce productivity by automating work distribution and/or productivity tracking.

GENERAL TECHNOLOGY BILLING

The completed state will include acquisition of technologies and/or the implementation of needed upgrades to the current billing solution to address gaps in customer billing and compliance. For example, solutions may include upgrades to the current CC&B system, improvements to ensure PCI compliance and implementation of scanning technology to support the manual service order dispatch and return process.

2.4 Program Activities

- Establishment of reliable bill printing, presentment, and delivery SRP
- Reduction of billing exception backlogs (e.g., unbilled accounts, estimated bills, etc.) to normal industry levels
- Establishment of improved dunning processes to drive increased collections and support achievement of Days Sales Outstanding (DSO) performance metric targets
- Centralization of back office operations to support standardized processes, improved quality and increased workforce productivity

Billing Accuracy & Back Office

- Establishment and development of billing and revenue protection (collections) policies, procedures, processes and standards
- Implementation of key technologies to support improved billing, payments, credit & collections and theft management

2.4.1 Additional Activities Identified Post-Commencement

Post-commencement the organization has identified additional key activities after evaluating root cause of related backlog and persistent issues. The initial assessment of backlog of items was believed to have been a lack of personnel, training or adherence to work completion. However, upon further evaluation, there are significant barriers and inefficiencies in the programming and configuration of Oracle CC&B that impedes the steady state billing function.

Some of the additional activities include, but are not limited to the following:

- Reconfiguration of roles and user functions in Oracle CC&B to provide proper workflows, error resolution and reporting. This will enable:
  - address error alerts to reduce returned mail
  - functional audits to support process adherence and employee coaching
- Reconfiguration of billing exception thresholds, alerts and routing for completion to enable timely billing
- Significant additions of billing segment charge exception handling by charge value and change from historical segments
- Programming and configuration changes related to account management for start, stop and transferring service as existing programming does not meet business process requirements and results in errors
- Programming changes for service order types and steps to create clarity, efficiency and tracking between the field and back office
- Programming, configuration, patching and change management of related business processes to address issues with meter lifecycle between integrated systems and process interdependencies
- Implementing controls, reports and alerts to address the current deficiencies to bring the billing system up to standard utility billing practice

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	

Billing Accuracy & Back Office

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☒ Enable the Digital Transformation	Direct
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Deliver Electricity at Reasonable Prices

By improving efficiencies and removing billing backlogs, the program will be able to ensure more reasonable prices for customers. In addition, by more efficiently handling billing and associated back office functions, along with increased use of digital platforms to engage with customers, the program will help to ensure better customer relations and deliver a more positive customer experience.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

This program will directly improve the systematic management of the business by actively reducing the number of manual processes, along with helping to support implementation of a fully integrated workforce management system. This will also improve employee efficiency.

This program will directly improve the systematic management of the business by ultimately eliminating the significant backlog of estimated, unbilled and other exception related accounts. This effort will enable management to be more effective in deploying employees and resources to keep accounts current and up to date going forward. Working down the backlog will improve back office efficiency, improve collections metrics and reduce accounts receivable.

This program will improve automated distribution and management of back office work to back office agents, thereby improving employee productivity and work quality.

This program also includes implementing tools which will empower management to actively measure and manage Key Performance Indicators (KPIs). Improved oversight and visibility of KPIs will improve the management, operations, and performance of the business.

Billing Accuracy & Back Office

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

Outsourcing the BP&D function to a third party vendor with a reliable emergency response plan and business continuity plan improves resilience of the billing system. Removing redundant bill printing and enveloping equipment will reduce risk and improve overall resiliency as these machines are vulnerable to flooding in their current location.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Enable the Digital Transformation

This program will enable the digital transformation by actively reducing manual processes currently in place and help support the implementation of a workforce management system. As such, the program will reduce manual efforts and their associated risks, enabling effective management and increased use of digital technology.

This program will enable digital transformation by actively improving the automated distribution and management of back office work.

The KPI dashboard supported by this program bolsters the enterprise-wide effort to adopt best in class utility practices, including the effective implementation and use of digital technology.

2.6 Program Risks

Risk associated with delaying the program/projects may include the following.

BILL PRINT & DELIVERY OUTSOURCING

- LUMA fully redesigned and branded bills may not be available at commencement
- LUMA bills may not be produced accurately or at all and/or delivered on a timely basis (e.g., due to relying on current outdated equipment/software)
- LUMA bills may not be immediately available via the LUMA website – Mi Cuenta (e.g., due to relying on current outdated equipment/software)

REMOVE REDUNDANT BILL PRINTING & ENVELOPING EQUIPMENT

- BP&D equipment being rendered useless in the event of a natural disaster and/or flooding
- BP&D equipment could break down due to age of equipment, thereby delaying issuance of bills

USE RESOURCES FOR BACK OFFICE PROCESSING OF SERVICE ORDER PAPERWORK AND MANUAL DATA ENTRY/UPDATE OF CC&B

- Lack of an effective, efficient and quality system for distributing service order field work and returning completed service order work (and manually entering into systems of record) will negatively impact the business
- The lack of an effective system will affect operations by driving inefficient disposition of work (e.g., inhibiting field resource optimization resulting in cost increases) and lowering customer satisfaction (e.g., delays in service order completion will delay new service connections or result in erroneous disconnection of service – both of which result in negative customer experiences

Billing Accuracy & Back Office

- Current systems, or lack thereof, inhibit the timely and accurate recording of work (e.g., due to delays in entering data or errors associated with uncontrolled manual data entry)

USE RESOURCES TO WORK DOWN OF ESTIMATED, UNBILLED, & OTHER BILLING EXCEPTION-RELATED ACCOUNTS

- Continued building of backlogs of unbilled accounts, estimated bills and other backlogs will lead to increased cost of servicing customers and decreased customer satisfaction
- Risk of not working down estimated bill backlogs (~143k or ~10% of 1.47m customers) will lead to increased customer confusion due to billing inaccuracy and customer dissatisfaction
- Risk of not working down unbilled accounts backlogs will lead to delayed revenue recognition and collections
- Risk of ongoing challenges being unable to send bills to streetlight customers, resulting in unaccounted for energy usage and lost revenue

CUSTOMER EXPERIENCE METRICS DASHBOARDS

- Risk of having an ongoing lack of transparency into performance (e.g., YTD actuals vs. monthly / annual targets) and inability to drive performance improvement

AGENT WORK ROUTING TECHNOLOGY FOR BACK OFFICE (WORK QUEUE ASSIGNMENT)

- Risk of not having visibility on intra-day/ month billing exception volumes for more effective management of backlogs
- Risk of not being able to track and manage productivity for sustained operational excellence

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$12.9**	**$12.1**	**$11.2**	**$71.1**
SRP Expenditures	$2.0	$1.8	$1.8	$1.8

3.2 Program Resource Requirements

To implement and stand up the new BP&D vendor, both vendor and LUMA testing resources are required to ensure timely and accurate bill production.

Collaboration with IT/OT: Collaboration with LUMA IT/OT resources will be required to stand up the new BP&D vendor (e.g., both bill testing and ensuring electronic bill availability on LUMA Mi Cuenta website).

Additional resource needs have been identified for the CC&B Optimization efforts. The program activities will be addressed through current vendors supporting the CC&B application. These resources will be required to support business functional system support, programming system configuration changes and system testing.

Billing Accuracy & Back Office

3.3 Estimating Methods & Assumptions

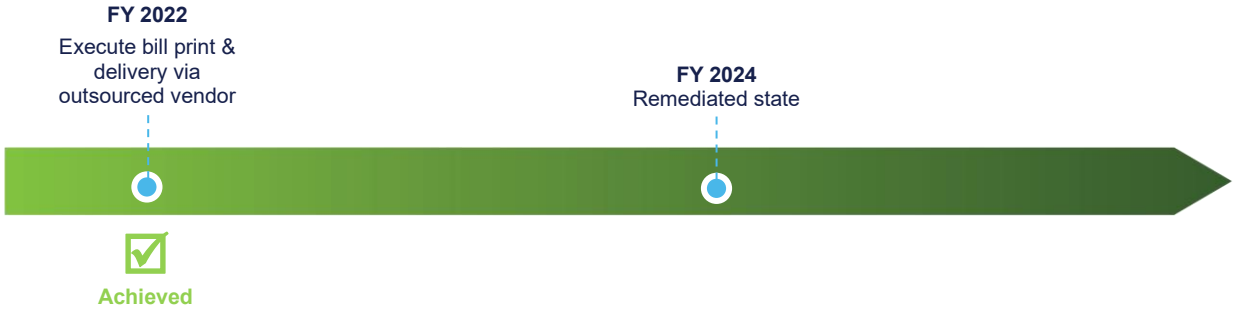
The BP&D vendor successfully launched the outsourced third party function at LUMA commencement.

Costs for the Billing Accuracy and Back Office program (and projects) were estimated based on historical program information, contract & internal resources, expected estimates received from third-party vendors and estimations of the number of employees and hours required.

Post-commencement the anticipated costs for Billing Accuracy and Back Office are being evaluated in two-parts:

- CC&B Optimization providing and billing system evaluation through a third party expert
- Revenue loss mechanisms through theft deterrence and field investigations

3.4 SRP Program Timeline & Milestones



Loss Recovery Program

1.0 Program Description

This program is targeted at reducing NTLs by the application of advanced monitoring and software techniques coupled with a significant number of inspection teams in the field. Initiatives include AMI revenue protection software and modules that can identify anomalies in equipment and customer consumption, enhanced data analytics, field theft detection tools and widespread inspections, all supported by a team of new back-office business and data analysts.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

The combined technical and non-technical energy loss for premier utilities across the US and Canada is below 4.5%. Most recently, PREPA reported 12.3% combined technical and non-technical losses, approximately 8% above industry levels. PREPA assumes that 7.8% of this 12.3% is due to technical losses, leaving 4.5% as non-technical losses. This program will address the NTLs.

The 4.5% non-technical losses represent 800 GWh of lost energy which could be recovered through a loss reduction program. The program objective is to reduce non-technical losses and avoid the current substantial economic loss.

Based on LUMA's project team experience, the actual non-technical losses could be even higher than the estimated 4.5% NTL factor. The NTL factor will be revised as the revenue boundary metering with PREPA Generation, meter recording, billing and collection data are improved.

The current loss control area at PREPA (e.g., ICEE Division) had ~60 field personnel, ~50 back-office personnel and 10 trucks. The ICEE Division focused on the energy theft or misuses of electrical energy by customers. Other staff of PREPA were tasked with addressing billing and uncollected funds. There was no formal collections team or group of employees dedicated to collections activities. A formal dunning process did not exist. A customer in arrears may have had the potential for a disconnection, but recovery of bad debt was not an assigned work task.

PREPA classified efforts to track NTLs using the following breakdown:

- Billing estimation, in which each case is analyzed to formalize their service in the meter reading and billing system.
- Uncollected amounts or bad debt. This focuses on amounts owed to the utility but not collected from customers. This includes consequences such as service suspension.
- Theft, which aims to identify tampered meters, by-passed meters, and service diversion.

Loss Recovery Program

Additional Gaps Identified Post-Commencement.

Additional gaps in billing losses have been identified and will be addressed through the Program Brief for Billing Accuracy & Back Office. The impacts of these losses will be measured and tracked. These additional gaps impacting NTLs include, but are not limited to:

- Unbilled accounts which are left for an outstanding period, resulting in losses. This occurs when an account has a bill segment or multiple bill segments that are unbilled and the customer in question is not billed in a timely manner (i.e., final bills).
- Underbilled accounts such as customers who are billed on estimates and the billing systems has received an actual meter read. For residential customers these estimations may only be corrected within a 120 day window under Law 272. The underbilling between the estimate and the actual is an extensive issue identified post-commencement.
- Underbilled accounts in cases where the customer is only billed the monthly customer charge without consumption.
- Historically, automated leads (tamper codes) from the Customer Care and Billing system have not been utilized consistently, if at all, to drive field investigations. These system parameters need to be revised to reflect current business practices.
- Programmed monthly reports with automated leads were not worked consistently. These leads were generated for inactive service agreements where the meter is registering consumption. Each represents a potential revenue loss that must be evaluated and addressed promptly.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

After completion of the project, the NTL factor should be reduced to levels close to zero. The almost total elimination of customers bypassing meters or diverting connections will also reduce safety concerns. Lowering the loss factor will largely eliminate the need to make up for the loss in electricity rates, contributing to more reasonable electricity rates (driven by a reduction in the loss factor included in customer tariffs) and a resulting rise in satisfaction for the customer.

2.4 Program Activities

- Development of NTL reduction plan including data quality review and coordination with metering department and Utility Transformation
- Measurement of Billing and Collections related NTLs on a monthly, quarterly and annual basis
- Customer and community based messaging and education to deter
- Field inspections
- Hiring and training of required personnel, including technicians and data analytics professionals
- Procurement of field equipment for field investigations
- Program completion would result a steady state that includes three main activities:
- Continued monitoring of the meters (either through physical inspection or electronically if AMI is implemented)
- Addressing meter violations/issues as they are discovered
- Maintain a minimum back office personnel and field inspection crew to ensure NTL are kept low, close to zero

Loss Recovery Program

Additional Activities Identified Post-Commencement

Stakeholder outreach has been determined to be an essential aspect of loss reduction and recovery. The key stakeholders include individuals or agencies involved in criminal prosecution of suspected electrical energy theft. Additionally, key groups play an important role in reducing the activities leading to a misuse of electrical energy in the field. These groups include the electrician's professional organizations, home builder's organizations, community watch organizations, mortgage professionals (such as during a home foreclosure and bank seizure) etc.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

This program reduces public exposure to an unsafe electrical system. Meter tampering and electricity diversions generally involve illegal access to dangerous and live electrical equipment. By largely eliminating this tampering, the program helps to reduce safety incidents among members of the public who would otherwise be engaged in such activity.

Loss Recovery Program

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver Electricity at Reasonable Prices

Loss reduction translates into lower rates borne by the customer. Customers benefit from lower rates as there is less need to compensate for losses in revenue due to NTLs.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Normalizing the metering system and constant technical patrol of distribution systems will dissuade customers from accessing the metering system to tamper or bypass it. The patrolling effort is recommended to continue over time as experience has shown that the NTL factor increases once customers realize the system operator has stopped patrolling their piece of the system.

Improved visibility and control of power flow will lead to better system planning especially when new technologies (e.g., Distributed energy resources [DER], renewable sources, Volt VAR Regulation/Optimization [VVO], etc.) are planned for future deployment.

2.6 Program Risks

Not executing or delaying the execution of the project results in a lost opportunity to recoup more than $165m in yearly operational costs, negatively affecting both LUMA, PREPA and customers (i.e., Puerto Rico's families and businesses). It will also allow public safety incidents associated with activities related to the high NTL factor to continue.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$4.8**	**$8.1**	**$16.2**	**$32.4**
SRP Expenditures	$4.8	—	—	—

3.2 Program Resource Requirements

Operations will be conducting field investigations or inspections and will utilize some tools to complete this work. These tools will be acquired through current available tools and over the coming years.

Visual inspections and meter testing to measure the loss will be key for inspections. Additionally, the following tools or technologies have been identified to support the program brief work.

- Enhancement of revenue protection module/software
- Procurement of revenue protection module/software
- Procurement of theft detection tool set, such as:
  - Field meter testing (line analyzer)
  - Baroscopic inspection camera
  - Underground voltage tracker

Loss Recovery Program

- Establishment of field inspections: These will be carried out by inspection field personnel with appropriate PPE, training, and using trucks

3.3 Estimating Methods & Assumptions

Initially, for years one and two of the programs, cost estimates were developed using subject matter experts to estimate costs for implementation of new processes, along with deploying inspection personnel to identify where fraud or theft is being committed, especially in industrial and commercial customer locations.

Future program years will include enhanced analytical abilities through technology and through training data analytics methods with back-office staff.

Distribution Meter Replacement & Maintenance

1.0 Program Description

This program deals with correction, replacement, and maintenance of distribution meters. In particular, the program will replace failed Two-Way Automatic Communication System (TWACS) meters, along with maintenance items related to improving communications within the existing TWACS system.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

- There are approximately78,000 failed TWACS meters that need to be replaced so that consumption can be measured, and customers accurately billed rather than being given bill estimations.
- The currently installed substation communications hardware decreases communication throughput and contributes to increased latency.
- To ensure that meters affected by switching can be properly located, better communication pathways are needed. There are currently a number of communications weak points and a lack of alternate communication paths. These issues should be addressed with improvements in feeder switching awareness system so that meters can be located by the TWACS system for reading.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not in the SRP.

2.3 Description of Program Completed State

The completed state includes:

- Replacement of all 60,000 failed / damaged meters (15% remediated) with working meters that are being successfully read by the TWACS system and billed based on meter reads rather than estimations
- All safety issues remediated
- All substations updated to the latest hardware, but at minimum, substations with greater than 5,000 meters up to the latest hardware such that the system can provide more granular data than monthly reads (i.e., daily reads) to support theft detection and other functionality such as pre-pay
- Alternate communication paths created with updates to GIS data to represent feeder reconfigurations, along with the establishment of acceptable communications quality to all meters to avoid bill estimation for meters that cannot be located after switching operations

2.4 Program Activities

- Identify failed meters and obtain failed meter identification information from PREPA

Distribution Meter Replacement & Maintenance

- Geographically locate failed meters
- Establish plan for replacing meters from a geographic perspective, and/or customer size perspective
- Issue RFPs for replacement of the meters
- Select vendors/contractors to complete the work
- Meter inspections to identify safety issues
- Replace meters
- Field work complete (remediated)
- Improved TWACS Communications

2.4.1 Additional Activities Identified Post-Commencement

No additional gaps were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Direct
	☒ Deliver Electricity at Reasonable Prices	Direct
☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Direct
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

Distribution Meter Replacement & Maintenance

Improves public safety as failed / damaged meters can represent a hazard to both customers and utility employees. Having customers with no electric knowledge exposed to energized electric meter services is a serious hazard.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Positive customer experience as electric consumption will be fairly charged based on actual meter reading rather than estimation.

Objective: Increase Service Reliability

Increases service reliability as functioning meters can assist with locating customers suffering from outages.

Creating alternate paths with the GIS data also updates feeder reconfiguration awareness, and thus will also increase reading reliability and avoid customer bill estimates.

Objective: Deliver Electricity at Reasonable Prices

Reestablishing accurate revenue from the failed meters can postpone or reduce future rate increases. Improves equability in that all are paying their fair share. For customers not paying their correct bill for consumption others are paying for their consumption.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure

Replaces meters that are no longer working due to storm damage.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid

Modernizes the grid by installing the latest communications equipment at substations that impact more than 5,000 customer meters to allow more frequent meter reads to support modern grid capabilities that more frequent reads can provide (theft detection, pre-pay, higher customer visibility to their consumption patterns, etc.).

2.6 Program Risks

Risks to delay and/or cancellation of this program include:

- Failure to address safety risks related to damaged meters
- Failure to deliver a positive customer experience and deliver safe, reliable electricity at reasonable prices
- Risk of malfunctioning substation communication equipment affecting consistency of meter reading

Distribution Meter Replacement & Maintenance

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$3.6**	**$21.5**	**$21.5**	**$150.5**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

Approximately 60,000 meters required.

External resources/contractors to carry out the meter replacements and additional TWACS communications equipment.

Replacement of meters to be incorporated into a meter replacement plan to cover the entire meter base.

3.3 Estimating Methods & Assumptions

The assumptions for average cost for meter replacements and TWACS communications equipment are based on experience with similar projects and obtaining costs estimates from a TWACS supplier.

Installation cost estimates are from a large North American meter installation company.

Standardized Metering & Meter Shop Setup

1.0 Program Description

This program to re-establish meter shop and test equipment is targeted at establishing a location for standardized meter testing and the provision of appropriate internal and external meter testing equipment. Enhanced procedures are also included, along with operational support for the new facility and equipment.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

The meter shop is currently housed in a temporary location in the hallways of a building in Carolina. These accommodations are entirely inadequate for operations, along with the receiving, cleaning, testing, sealing and storage of meter accuracy equipment.

The management of meters does not currently meet the requirements of Act 57-2014 as amended or the OMA, including requirements for accurate metering and periodic testing. For these reasons, this is a SRP item. The requirements for new and existing meter accuracy testing cannot be achieved with the processes and test equipment currently available. In addition, the requirement to test wholesale account meters every two years is not being followed in the current state.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In accordance with requirements outlined in Act 57-2014, as amended, and under the OMA, the remediated state will be achieved when a new meter shop is implemented, and minimal test equipment is purchased and functioning to allow for acceptable testing of meters that provides results that its metering products and services provide the customer with accurate metering and reflect a commitment to good professional practice consistent with all applicable contract requirements, laws, or regulations.

2.3 Description of Program Completed State

The completed state includes the achievements of the remediated state along with the following:

- Fully capable meter shop and full amount of test equipment capable of supporting business needs on the metering front
- Development of a process for meter sample selection and meter testing verification
- QA/QC of the meter handling process
- Documented processes enhanced related to inventory, work orders, and head end system updates
- Onsite test processes developed and documented for instrument meter installations

Standardized Metering & Meter Shop Setup

2.4 Program Activities

The following activities, primarily related to activities required by Act 57-2014, as amended, need to be undertaken:

- Acquisition of a building or finding an existing PREPA building location which can effectively handle meter shipments, warehouse space for meters, test boards and associated office space
- Requisitions for test equipment
- Installation of appropriate test equipment at the new facility
- Transferring all operations from the Carolina location to the new facility
- Implementation of new and enhanced processes as soon after the Service Commencement Date as possible and this would include QA/QC programs and procedures
- Implementation of MV90 cell connectivity

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

Standardized Metering & Meter Shop Setup

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

This program will enable implementation of AMI. AMI will improve reliability by providing immediate alerts when outages occur.

Objective: Deliver Electricity at Reasonable Prices

Accurate metering will ensure customers pay their fair share thereby lowering costs to other customers.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

A functioning meter shop building with the proper equipment will improve O&M efficiency by allowing more throughput of meters with the same number of people.

Objective: Enable Employees to Execute Operations Systematically

Factory Acceptance Test (FAT) meters will be checked for correct configuration for full-scale deployment, thus allowing employees to execute routine meter tests more efficiently and accurately.

2.6 Program Risks

If this program is not implemented, the ability to perform routine meter tests and the required commercial account periodic testing will still lag behind requirements. In addition, AMI deployment would be heavily affected without the ability to handle the large number of meters involved. Also, Contract Standards would likely not be met.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$4.3**	**$3.7**	**$6.7**	**$25.6**
SRP Expenditures	$2.7	$0.1	$0.1	—

3.2 Program Resource Requirements

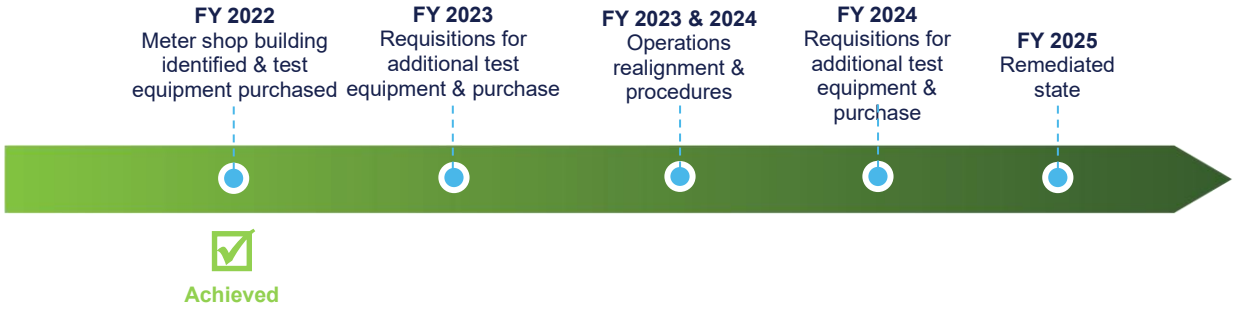
If a new building is built, it should be custom designed for the new meter shop requirements. If an existing building is acquired, modifications will be necessary for the specialized services to be provided.

3.3 Estimating Methods & Assumptions

Estimates were performed using vendor estimates for test equipment. A suitable existing PREPA facility has not been determined.

Standardized Metering & Meter Shop Setup

3.4 SRP Program Timeline & Milestones



Modernize Customer Service Technology

1.0 Program Description

The Modernize Customer Service Technology program is primarily focused on remediating the telephony technology through the development and implementation of a new cloud-based contact center platform. Contact center software allows for the management of a high volume of inbound and outbound customer communications across a range of channels. Modernizing contact center and associated procedures will mitigate LUMA's risk of customers being unable to report emergency situations. The program will create real time dashboards and reporting to cover key performance indicators across all of Customer Experience, including the contact center, district offices and billing services.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

A new contact center platform is needed to replace the existing Avaya 6.2:

- The existing platform is beyond end of life and no longer supported by vendors, meaning that as the technology degrades, it can no longer be fixed. If the contact center platform is not replaced, LUMA will be unable to take emergency calls from customers which will impact public safety.
- In emergency response situations it is faster and easier for customers to report situations via digital channels (smart phone app, social media, text, etc.). The current platform does not support digital channels.
- The current platform does not support a quality assurance program including call and screen recording; this does not provide visibility to see if contact center agents are following proper emergency and safety processes.
- The current platform does not support management for customer interactions through other digital channels like email, chat, or social media.
- Current outsourced vendors use two separate contact center platforms. As a result, there is no consistent reporting to support key emergency and outage response performance metrics or consistent delivery of customer service. In the completed state, all contact center interactions (phone calls, email, chat, etc.) will be tracked and managed through the new cloud-based platform.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, agents will be able to reliably take calls using a cloud-based contact center platform in support of emergency operation. This means reporting will be consistent for contact center performance and agents will be able to take calls from any location (e.g., home) to support emergency situations. This new platform will enable LUMA to meet obligations, in accordance with Act 17 and the T&D OMA, including:

Modernize Customer Service Technology

- Adopting new technologies to improve and minimize wait times for customer service, as outlined in Act 17-2019.
- Managing all aspects of customer relationships in compliance with Applicable Law as outlined in the T&D OMA.
- Monitoring industry advances and changes in technology related to customer care and related services as outlined in the T&D OMA; and
- Establishing and maintaining customer contact by means of call centers as outlined in the T&D OMA.

2.3 Description of Program Completed State

In the program completed state, a new customer service platform will support:

- The ability for contact center agents to work remotely during storm or emergency situations
- A QA) program to review agent interactions (through call and screen recording) and provide coaching and feedback on a regular basis
- First Contact Resolution monitoring and management
- Post-interaction customer surveys following phone/chat interactions
- New digital channels (e.g. chat, social media)
- Consistent reporting to support our OMA commitments for average speed of answer and abandon rate

2.4 Program Activities

- Execute contract to procure new cloud-based contact center platform
- Deploy and use new cloud-based platform to meet basic requirements for all call routing, IVR, and reporting
- Installing and configuring the new platform with the appropriate users, skills, queues, and routing logic
- Developing the IVR to provide customers with self-service options (e.g. account balance, report an outage)
- Configuring new QA evaluation criteria / scorecards in the platform
- Developing new reports to support all CX departments
- Training contact center agents on the use of the new platform

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	

Modernize Customer Service Technology

☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Enabling agents to work remotely during a storm situation or pandemic increases their personal safety.

Objective: Implement Effective Public Safety Practices

The new contact center platform will impact public safety by:

- Providing a reliable supported platform to enable consistent customer communication (i.e., no phone system outages)
- Providing faster response time for customer calls (e.g., to report a dangerous situation)
- Providing flexible staffing/location options (e.g., work-from-home or re-location to other offices) to provide continuous support through storms or other emergencies

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

- The platform will have a direct impact on the customer experience through:
  - Delivering new self-service options
  - Supporting new customer support channels (e.g., email, chat, social media)
  - Supporting efforts to decrease customer wait time before speaking with an agent (i.e., Average Speed of Answer)
  - Enabling QA efforts to improve First Contact Resolution

Objective: Increase Service Reliability

Faster response to outage calls results in faster restoration times.

Modernize Customer Service Technology

2.6 Program Risks

Not pursuing this program will prolong current working conditions, including the end-of-life contact center platform. This entails an operational risk as LUMA will face difficulties in responding to customer needs. Additionally, continued use of the current contact center platform will hamper LUMA's ability to respond to emergency calls, thus impacting public safety.

Risks associated with implementing the new cloud-based platform include an:

- Inability to secure funding / establish contracts in a timely manner
- Inability to implement and test new platform in a timely manner

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$2.7**	**$2.5**	**$2.7**	**$13.4**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

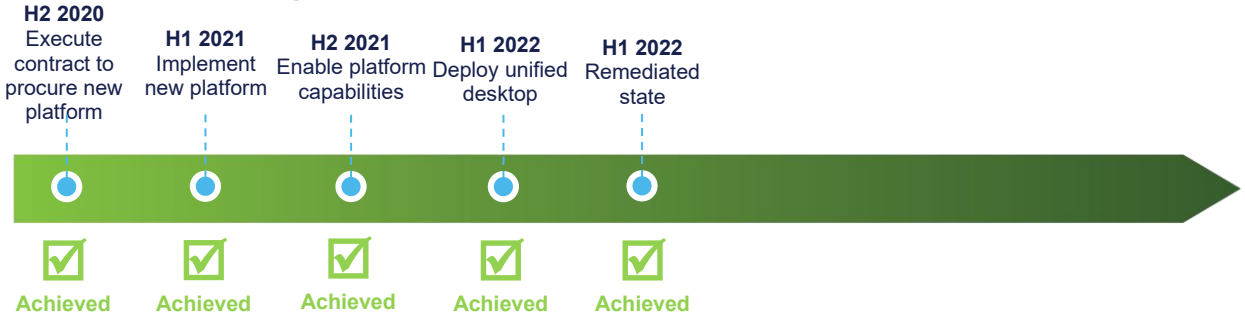
This effort is largely dependent on support from IT for:

- Contracts and vendor management
- Telecom infrastructure
- Laptop/desktop connectivity
- User provisioning
- Cybersecurity reviews
- Integration with other platforms (primarily Oracle CC&B)

3.3 Estimating Methods & Assumptions

Costs for the new cloud-based contact center platform implementation were provided by the vendor as part of a thorough RFP and evaluation process conducted by a team of PREPA and LUMA business and IT representatives.

3.4 SRP Program Timeline & Milestones



Streetlight Billing

1.0 Program Description

This program is an audit of streetlights and associated billing. PREPA has approximately 500,000 streetlights which should be audited on a regular cycle to be determined based on asset management procedures. This program will require LUMA to complete a physical audit of the streetlights, assigning each with a unique indicator/asset tag. Once this process is complete, updates will be made in the CC&B system to ensure customers are being billed accurately for their lights. The program also includes communication with customers on corrections to the street lighting system.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

In the current state, PREPA has 500,000 streetlights, but none of these have a unique identifier/asset tag. LUMA's gap assessment shows that a billing audit of these streetlights has not been completed. Without an audit system for streetlights, they cannot be incorporated into KPIs and there is no assurance of correct billing.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, all streetlights will have been physically audited and updated with a unique identifier and asset tag and processes to identify lights out and dispatch repair crews will have been defined and documented.

Completing the audit and reaching a remediated state will enable the Customer Experience team to meet the billing improvements and accuracy requirements as outlined under the OMA including:

- Implementing and optimizing billing; and
- Implementing accounting and reporting practices for billing, tracking, reporting, management and collections, including for services related to lighting.

To ensure accurate and timely billing of all services, LUMA will comply with applicable laws and regulations and the requirements as outlined under Act 83, Act 17, and Act 57 including:

- Conducting business in a responsible and efficient manner with accurate fiscal and operational practices as outlined in Act 83; and
- Adhering to provisions that pertain to developing the form and content of bills, billing of municipalities, and dealing with billing disputes as outlined under Act 17 and Act 57.

Streetlight Billing

2.3 Description of Program Completed State

In the completed state, the new program outlined above will be completed and LUMA will have:

- Improved customer and company ability to report streetlight outages and LUMA response, which improve traffic safety and visibility, pedestrian safety and personal security by allowing pedestrians and motorists to see one another better
- Updated Oracle CC&B streetlight data with correct address locations, wattage details and asset tag information to provide timelier response and dispatch to outages, including customer requests and complaints
- Improved accuracy and billing of public lighting and billing to municipalities, contributing to better communication and relationships with municipalities

2.4 Program Activities

- Asset Management will complete a physical audit and provide a list of all streetlights including location, owner, wattage and light type.
- Billing Services and/or Regional Customer Experience functional areas will update Oracle CC&B such that each light has a unique billing account.
- Develop processes between Customer Experience, Asset Management and Operations to identify lights outs, including mechanism to allow customers to report lights out.
- Create process for dispatching Operations to respond to lights out.
- Identify KPIs related to lights out response times.
- Physical and billing audit of streetlights: The billing audit and updates will happen after the physical audit is completed in the field. This may occur in different phases depending on how the physical audit is scheduled. For example, work may start in a specific region following the completion of the physical audit.
- Updates to billing. In year one, the focus will be on quick wins to update the system. The Customer Experience team will then update the billing system. The team will be required to communicate with affected customers.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Indirect
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Indirect

Streetlight Billing

☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

This program enables better streetlight management. Streetlights improve traffic safety, pedestrian safety and visibility and personal security by allowing pedestrians and motorists to see one another better.

Customers will be able to identify lights by their unique identifiers and be able to call to report outages.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Deliver Electricity at Reasonable Prices

This program will help increase customer satisfaction as customers can identify streetlights by their unique indicator, streamlining customer interactions.

This program will help build better relationships with municipalities to be less reactive and more proactive in the maintenance of the streetlights.

Increased revenue from streetlighting put downward pressure on the overall revenue requirement thereby reducing electricity customer's rates.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

This program will increase accuracy in streetlight billing, enabling more systematic management of the business.

Streetlights can also be incorporated as a performance metric which will be reviewed yearly.

Streetlight Billing

Estimated increased revenue: $1,500,000

2.6 Program Risks

If the program is not implemented, LUMA will be unable to meet its commitment under the O&M Proposal T&D 4.2.6. The proposal states:

- Over a two-year operational period, LUMA will complete an audit on all public lighting assets. A unique identifier will be attached to each asset to support the detailed inventory. During this inventory, T&D Operations and Customer Service groups will work closely to complete a billing audit.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$1.3**	**$0.6**	**—**	**—**
SRP Expenditures	$1.3	$0.6	—	—

3.2 Program Resource Requirements

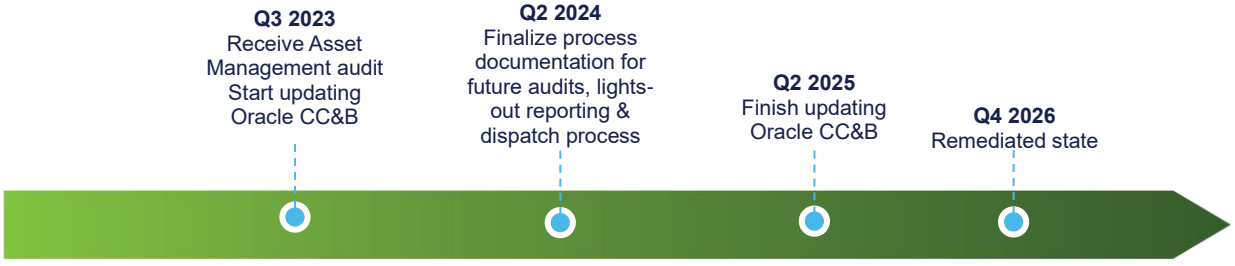
- Customer Experience Representatives
- A scan of the data entered the asset and GIS databases
- A scan of all public lighting and billing data from the CC&B system

3.3 Estimating Methods & Assumptions

The following assumptions apply:

- 100% of the lights will require updates in the CC&B system to add the unique identifier/asset tag
- An estimated 70% of the streetlights will require billing updates, resulting in debit and/or credit to customers

3.4 SRP Program Timeline & Milestones



Voice of the Customer

1.0 Program Description

This program focuses on customer service, providing customers with increased voice, and improving tracking of customer service interactions. Quality assurance mechanisms implemented under this program include customer surveys, welcome packs, customer center voice and screen recording and customer complaint tracking and case management. The program also includes process and communications improvements such as quantitative analysis of KPIs and other metrics to improve overall customer service, along with customer experience training for employees.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

The VoC program is not an applied concept at PREPA. There is currently no program in place to regularly monitor customer interactions, measure customer sentiment/feedback or identify opportunities to improve the overall customer experience.

Gaps identified include:

- A method to capture First Contact Resolution (FCR) to assure that we are meeting the customer's needs in the first interaction
- A method to consistently capture / report on CSAT
- A method to consistently identify and prioritize customer issues

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the completed state, the new programs will be in place to provide:

- J.D. Power customer surveys
- Post-interaction customer surveys following phone/chat interactions
- A QA program to review agent interactions and provide coaching / feedback on a regular basis
- New digital channels (e.g., chat, social media)
- An enterprise-wide customer experience training program
- Speech & text analytics to dive into customer dissatisfiers
- A monthly Voice of the Customer Report to enable prioritization of process improvements.

Voice of the Customer

2.4 Program Activities

- Contract with J.D. Power to conduct initial customer surveys
- Development of FCR tracking program using new contact center management platform
- Coordination with PREB offices to establish new customer PREB complaint tracking
- Implementation of speech & text analytics
- Development of the IVR and agent desktop with the cloud-based contact center system to capture FCR information and post-interaction customer feedback
- Creating QA evaluation criteria / scorecards and hiring and training new QA analysts to establish the new QA program
- Build out of the speech and text analytics lexicons
- Build out of the Voice of the Customer analytics report

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Indirect
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☒ Pursue Project Delivery Excellence	Indirect
	☐ Enable Employees to Execute Operations Systematically	
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

Voice of the Customer

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

The VoC program gets directly to what customers are missing from a safety perspective - it will enable LUMA to find gaps in public safety communication.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

The VoC program will directly measure customer sentiment / feedback and provide new insight into areas of the operation that may need to be changed to improve the customer experience.

The VoC team will also work closely with other departments to ensure other customer-facing initiatives are aligned to best meet the customer needs.

Objective: Increase Service Reliability

The VoC report will enable LUMA identification of areas with reliability issues through recording and performing speech analytics on all outage and emergency calls.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Pursue Project Delivery Excellence

By providing better visibility into customer feedback, this program will identify areas for improvement of project delivery.

2.6 Program Risks

Not pursuing the VoC program will limit LUMA's visibility of customer needs and prevent tracking of KPIs that are built around this program.

The primary risk for the VoC program is in its dependency on the successful and timely implementation of the new contact center platform. Without the new platform, many of the benefits of the VoC program cannot be realized.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$0.7**	**$0.7**	**$0.7**	**$4.6**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

- New cloud-based contact center platform
- New LUMA VoC organization

- Quality assurance team to monitor calls and provide agent coaching
- Process improvement team to implement best process management practices using data analytics to identify key opportunities for improvement and drive initiatives to address them
- Self-service channels team to drive the implementation of leading-edge customer care (e.g. mobile apps, web site capabilities, chat, social media, etc.)
- Training team to support the CX department and to provide customer-centric training company-wide
- Analytics team to develop and produce the monthly VoC report collected and analyzed from multiple data sources

3.3 Estimating Methods & Assumptions

Costs for the VoC programs were estimated based on employee-months of effort for each of the specific projects plus annual subscription costs for additional software and third party services that may be required. For example:

- Speech & text analytics module (software)
  - Cost determined through RFP response
- Complaint tracking module (software)
  - Cost estimated from online research
- J.D. Power surveys (service)
  - Actual cost from vendor

AMI Implementation Program

1.0 Program Description

An AMI implementation program establishes two-way remote meter reading reporting and control capabilities. Such programs enable a broad range of capabilities that result in cost savings to the utility and customer satisfaction improvements. This is achieved by providing the ability to offer more granular consumption data, bi-direction metering, outage notifications, power quality measurements and remote connects / disconnects. For the utility, operational savings and revenue protection are critical drivers as well as OMS, DR, Data Aggregation (DA), load forecasting, load research, rate studies and many other critical modern utility functions. An AMI program is usually seen as a top priority foundational program due it its large number of related and dependent programs and the savings and customer benefits that are immediately available.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

PREPA does not have an AMI system. They have a fully implemented TWACS system that is essentially an AMR (Automatic Meter Reading) system, reading ~1.5m meters. The current Aclara meters are not AMI meters and cannot meet the requirements of Act 17. The functions of an AMI metering system are described in the Program Description above. PREPA has conducted some AMI pilots for replacement of the current meters, but these have been poorly implemented and a portion have been abandoned. PREPA currently does not have a successful AMI pilot, business plan or high-level implementation plan.

A MDM system is considered integral to the effort in AMI since it provides many of the data analytics utilized by other applications and company programs. In particular, an MDM is a critical element in load research and revenue protection. PREPA's MDM system (currently being completed) may be adequate for the current AMR system, but it does not have all the capabilities needed for an AMI system.

PREPA investigated pre-pay a few years ago but did not move forward with it. They also do not have an approved rate for implementing pre-pay. PREPA also had an AMI RFP in process in 2018 that was prepared by Accenture. This was put on hold due to the pending LUMA contract. This work would need to be revisited and revised since it does not appear to have contemplated departmental needs broadly across the organization.

This program will include consideration of the document "PREB CORE GUIDELINES – Electric Distribution Planning, Section 12 Phased Adoption of Advanced Metering Infrastructure" and Act 17 including:

- Develop a strategic plan for the phased adoption of AMI that identifies the different benefits that can be achieved with this technology, e.g., characterization of power quality, conservation voltage reduction (CVR) mechanisms, facilitation of Fault Location, Isolation, and Service Restoration (FLISR) functionality, identification of favorable locations for the integration of distributed renewable energy, strengthening of the utility telecommunications & control signals networks

- Identify opportunities where the current expansion of the 5G communications infrastructure (PREPANet) can be used to strengthen the utility's telecommunications network and thus increase system visibility and secure its operational functions (part of the LUMA Telecom initiatives).
- Make use of AMI to mitigate both technical and non-technical losses
- Make use of AMI to identify feeders that can benefit from demand response programs and energy efficiency mechanisms (will be included in requirements gathering in conjunction with LUMA's DR and Energy Efficiency (EE) initiatives)
- Act 17 considerations such as making net metering, demand response and other programs universally available across the island

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the completed state, LUMA/PREPA will have implemented highly capable AMI & MDM technologies able to address many operational needs such as revenue protection, service restoration expediency and system data analytics, among others. These systems will coordinate with other grid modernization efforts that can take advantage of smart metering and the associated communication canopy that would accompany an AMI system. It will be tightly integrated into other utility IT systems to maximize the value of AMI to the utility and their customers. These integrations include, to various levels: customer billing, customer information portals, OMS, ADMS, CVR, work order management systems (WMS) and others.

Expected benefits of the program include:

- Expanded use of net metering to enable more widespread use of solar or other renewables
- Improved customer satisfaction with customer web portal features such as:
  - Detailed views into electric usage during the month on at least an hourly granularity
  - Flexible payment options including bill date selection, offering different rates such as time of use (TOU), demand, etc., along with prepay and levelized billing
  - Alternate rate comparison capability to allow customers to examine "what if" scenarios if they had been on an alternate rate
  - Customer alerts and notifications based on budget and/or electric consumption targets, outages, etc.
  - Ability to schedule power re-connect/disconnect
- Better environmental responsibility due to reduced truck rolls and enabling remote resolution to address customer concerns such as billing read verification
- Tamper and theft notification
- Better non-pay management through deployment of remote disconnect to all residential meters. This has the added benefit of reducing operational costs on move in/out and allows for universal, seamless prepay implementation.
- Improved overall conservation with features such as:
  - Providing detailed customer electricity usage information to identify high electric usage in shorter timeframes before they become critical

AMI Implementation Program

- Identifying system losses with system energy balances and electric consumption analysis
- Enhancing operational and financial performance through revenue recovery
- Improved operational efficiencies through increased situational awareness of electric systems
- Improved outage response and restoration speed with detailed knowledge about location and extent of outages in near-real-time
- Improved operational efficiencies, expense, and environmental impacts of truck rolls using remote connect/disconnect electric meters to support remote turn on/off for non-pay, move in/out and prepay

2.4 Program Activities

- Create a strong cross-functional team to oversee formation of the business plan and manage implementation of the technologies
- Develop business plan and file for PREB approval
- Develop scope, process improvements and technical requirements documents for the technologies
- Upon receipt of PREB approval, issue an RFP for the decided scope of work
- Upon vendor(s) selection order equipment and commence installation/construction:
  - Installation of a head-end system to capture & partially validate meter data
  - Installation of an MDM system that imports data from the head end system, completes validation, allows analytics, and makes it usable by other IT/OT applications
  - Installation of a communication infrastructure to bring meter data from the meters to the head-end
  - Installation of smart meters, beginning with commercial and industrial (C&I) customers and then residential customers. Likely over a 5 year period based on budget constraints.
  - Integration of AMI data with the customer billing system, customer information portals, OMS, WMS, and other available applications
- Put in place a strong centralized organization to manage this and other metering systems that may be in place, such as MV-90
- Assure IT/OT applications continue to utilize AMI data effectively and accurately
- Develop/implement algorithms and information portals that analyze MDM data for operational and business purposes (e.g., distribution system planning, energy theft, etc.)
- Develop and implement ongoing partnerships and other business agreements with vendors to manage and maintain the technologies, as needed
- Develop and implement processes and methods to capture and measure benefits obtained from the technologies
- Report technology performance and benefits internally and externally as needed

2.4.1 Additional Activities Identified Post-Commencement

No additional gaps were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	

AMI Implementation Program

☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Direct
	☒ Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Indirect
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Direct
	☒ Enable the Digital Transformation	Direct
	☒ Enable the Sustainable Energy Transformation	Indirect
☐ **Other**	☐ Other	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

By providing visibility into their service status and improving restoration speed, giving them usage information to facilitate conservation, practically eliminating estimated billing, facilitating establishment of smart home technologies.

Objective: Increase Service Reliability

Through the understanding of service status via communications from the meters, incorporation of meter status info in OMS for improved equipment outage predictions and more accurate crew dispatching therefore improving service restoration speeds.

Objective: Deliver Electricity at Reasonable Prices

Through cost reductions due to practical elimination of manual reads, reduced truck rolls and travel time, practical elimination of energy theft, and facilitation of peak load management which can postpone capital improvements.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Through AMI integration with the outage management system. Allows for better planning of the system through the understanding of actual load and trends.

AMI Implementation Program

Objective: Pursue Project Delivery Excellence

Through improved service restoration speed and reduced operational costs.

Objective: Enable Employees to Execute Operations Systematically

Integration of data with OMS will allow better equipment outage predictions. Understanding of meter status will identify nested customer outages that could be missed without the technology, and the remote connect/disconnect capability saves truck rolls and potential negative customer interactions.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid

By establishing two way communications with customer meters, collection of additional system data such as voltage and power quality information that can help improve service quality, establishing a communication infrastructure that can also be leveraged for distribution automation technologies.

Objective: Enable the Digital Transformation

Through the installation of digital smart meters that, in addition to increasing service reliability and conservation benefits, can facilitate the establishment of smart home/business technologies.

Objective: Enable the Sustainable Energy Transformation

Through peak load reduction programs, conservation voltage reduction, electric energy conservation, and facilitation of installation of distributed energy resources.

2.6 Program Risks

Aside from not fully obtaining the benefits mentioned above, continuing with the status quo will exasperate current problems/issues:

- AMR is currently an IT initiated process with inadequate involvement of metering and operations
- Personnel in metering operations and ICEE Metering Solutions (theft detection) are limited, resulting in lost revenue
- Theft detection tools available in current technologies such as CC&B and AclaraONE are limited
- The MDM implementation underway will have limited utility in the current AMR system, minimizing potential benefits

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	—	**$0.1**	**$0.1**	**$0.6**
SRP Expenditure	—	—	—	—

AMI Implementation Program

3.2 Program Resource Requirements

- Cross functional team to oversee formation of the business plan and manage implementation of the technologies (estimated 10 full time employees)
- AMI head-end technology
- MDM technology
- 1.52M smart meters with built in communication capability (90K C&I meters, 1.43M residential meters)
- Communication equipment such as repeaters/relays, access points, and data concentrators. (~3K devices depending on supplier architecture)
- 100 contractor personnel to complete meter changeouts
- Internal/external personnel to install the communication network
- Internal/external IT/OT personnel to complete and manage the application installation and connectivity
- A strong centralized organization to manage this and other metering systems that may be in place, such as MV-90 (estimated eight full time employees)

Working on obtaining federal funding from United States Department of Housing and Urban Development (HUD) through Community Development Block Grant Disaster Recovery (CDBG-DR) program for replacement of current AMR system to an AMI system. The HUD funding would be used for the Meter Replacement Program.

3.3 Estimating Methods & Assumptions

Average cost for meter replacements and communication costs are based on experience with similar projects as well as estimates obtained from potential suppliers. Installation cost estimates are from a large North American meter installation company and AMI system suppliers.

C.2 Distribution Portfolio

The distribution system received temporary emergency repairs after Hurricanes Irma and Maria to quickly restore service, which will need further permanent Recovery work. The majority of distribution portfolio spending over the next three years will therefore be focused on improving system recovery and resilience. Investments in reliability improvements will also improve customer experience and distribution automation investments will contribute to enabling the sustainable energy transformation. Table C-4 below presents a summary of the program spending for the largest programs in the distribution portfolio, followed by a short description of each program.

Table C-4. Distribution Portfolio Spending Estimates by Program ($ million, real)

	FY2023				FY2024	FY2025
Distribution Programs	**Federal Funded Capital**	**Non-Federal Funded Capital**	**OpEx**	**Total Spend Estimate**	**Total Spending Estimate**	**Total Spending Estimate**
Distribution Pole & Conductor Repair	54	1	11	66	71	81
Distribution Line Rebuild	51	5	0	56	161	422
Distribution Automation	26	8	1	36	53	53
Distribution Lines Assessment	20	0	1	21	20	20
Grand Total	**151**	**15**	**13**	**179**	**306**	**577**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

Distribution Pole and Conductor Repair. This program focuses on minimizing the safety hazard caused by distribution poles and conductors that need to be repaired or replaced. Major repairs and replacement will be based upon the results of an assessment of the distribution system and an analysis by engineers to schedule the repair or replacement based on the criticality of the pole. Following this process, safety hazard and priority poles will be replaced, along with damaged conductor and hardware.

Distribution Line Rebuild. This program replaces damaged or ineffective overhead and underground distribution lines. This program includes the following initiatives, a mix of SRP and non-SRP work:

- Perform distribution line upgrades to improve reliability and resiliency
- Restore out of service circuits as deemed necessary
- Complete unfinished circuit construction presently abandoned as deemed necessary
- Perform circuit voltage conversions to improve distribution capacity (non-SRP)
- Build new distribution line extensions to connect new customers (non-SRP)
- Install underground cable and/or tree wiring to improve service reliability and resiliency to critical customers (non-SRP)

Distribution Automation. This program focuses on establishing equipment for distribution automation. This includes the installation intelligent switches fuses, fault indicators, and reclosers on select feeders

(including main line and feeder ties) to reduce the number of customer interruptions per outage occurrence.

Distribution Lines Assessment. This program is targeted at the assessment, testing and studying of distribution lines, along with required spot repairs and replacements. Distribution line assessment will first be prioritized by worst performing feeder and highest criticality with the initial assessment focusing on the identification of SRP items. Because of the magnitude of the work, the SRP portion of the assessment program is anticipated to take four years to complete with the remainder of assessments to be completed after the SRP period.

Its aim is to help to restore the system and improve reliability and resiliency in line with current codes and standards, including, but not limited to:

- Assessment and treating poles
- Performing ground rod assessment and minor repairs / replacements
- Assessment and replacing anchors and guys
- Assessment of conductor condition
- Performing line clearance checks to ensure that distribution assets meet live line clearance requirements under the applicable codes and standards
- Assessment of streetlight heads and poles
- Identification of third party attachments
- Assessment of third party attachments for applicable code violations as it pertains to the electrical system

The identified major repairs and replacements will then be undertaken by a separate program.

Distribution Pole & Conductor Repair

1.0 Program Description

This program focuses on minimizing the safety hazard caused by distribution poles and conductors that need to be repaired or replaced. Major repairs and replacement will be based upon the results of an inspection of the distribution system and an analysis by engineers to schedule the repair or replacement based on the criticality of the pole. Following this process, safety hazard and priority poles will be replaced, along with damaged conductor and hardware.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Field inspectors will categorize assets according to their health, based on estimates of their condition (likelihood of failure) and engineers will assess the criticality (consequence of failure) with a score of 0 (worst) to 4 (best). Mitigation of risk related to only the highest risk assets will be categorized and performed as SRP work. LUMA estimates that approximately 20 percent of the assets comprising the distribution lines require safety and hazard mitigation to reach remediation. These deficient assets will exhibit the following:

- High risk of failure, or already failed
- *and* likely to cause:
  - A safety impact to the workers or the public,
  - Failure to meet applicable legal requirements or policies, including Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations, or

An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects. Initial analysis has uncovered the following issues:

- Distribution structures that are not compliant with applicable laws and policies, specifically under OMA Annex I, Act 17 and Act 57
- Anchors and guys need to be reinforced or replaced. It is known that a large proportion of them need some form of remediation work, but there is no exact data on which ones need improvement
- The frequency of forced outages is much higher than industry norms
- There are insufficient records of what equipment is damaged, the nature of the damage, and its location

A large portion of distribution poles, hardware and conductors require replacement either due to damage from severe weather events or because they have reached the end of useful life becoming more prone to failure. Safety priority poles and associated hardware and conductors are often neglected, contributing to the unsafe operation of the grid by increasing asset failures, failing to address conductor clearance issues, and increasing arc-flash risks.

Distribution Pole & Conductor Repair

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

High risk findings of the distribution poles, hardware and conductors, those that have an inspection score of 0 or 1, shall be incorporated into a remediation plan and mitigated. LUMA will take a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

To achieve the remediated state LUMA will have first identified all distribution poles, hardware and conductors to be repaired and replaced to meet current codes and standards. This work is described and will be performed under the Inspection of Distribution Lines program.

In the remediated state, the distribution poles, hardware and conductor assets identified as high risk with an inspection score of 0 or 1, currently estimated at approximately 20 percent of all distribution poles, hardware and conductors, will have been repaired and replaced to meet current codes and standards, and requirements under Applicable Laws and the OMA.

2.3 Description of Program Completed State

After the completion of required repairs and replacements of distribution poles, structures, and conductors (as determined by the inspection activities), LUMA will have established a system resilient to severe weather with higher service reliability and assets that have an extended life span.

2.4 Program Activities

- Perform inspections, as well as compile pole inspection data from various sources to avoid duplication of work already completed
- Ensure adequate pole, hardware and conductor stock for replacements identified through the inspection program
- Replace safety hazard poles and associated hardware
- Replace priority poles and associated hardware
- Replace damaged conductors
- Replace/upgrade guys, anchors and foundations as needed
- Upgrade the structural integrity of the distribution lines by replacing guys and anchors
- Initiate job orders based on the results of the inspections
- Complete engineering designs for the replacements
- Organize employee resource, equipment and materials
- Acquire all necessary permits and approvals
- Schedule work and replace poles to meet the latest safety codes and loading factors as those in alignment with the latest design criteria and Acts 17 and 57

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

Distribution Pole & Conductor Repair

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

The program increases field personnel and public safety by replacing poor condition poles and associated hardware and conductors that have a high risk of failure and/or are in a hazardous state of disrepair.

The program also contributes to the safe operation of the grid by reducing potential pole, hardware and conductor failures, addressing conductor clearance issues and reducing arc-flash risks.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

The program improves reliability by reducing the number of outages that result from pole and associated hardware and conductor failures.

Distribution Pole & Conductor Repair

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

This work will be completed with a large portion of the federal funds allocated for the remediation of the Puerto Rico electric transmission and distribution system. Funds will be used effectively and their use for this program will deliver significant value for money given the enormous benefits associated with rebuilding the system into a resilient network.

Objective: Restore Damaged Grid Infrastructure

The program replaces distribution poles and associated hardware and conductors that are in poor condition due to damage from severe weather events and aging.

Objective: Improve Resilience of Vulnerable Infrastructure

Poles that need replacing will be replaced with structures that meet the updated design criteria and will be either higher strength wood, concrete, steel, composite or other types of poles that will increase resiliency to harsh weather conditions. While changing poles, guys, anchors and grounds, other equipment on the poles will also be upgraded at the same time.

2.6 Program Risks

Risks related to delaying or not performing this work include:

- Failure to provide a safe work environment for field personnel
- Failure to reduce public safety risks
- Potential adverse consequences for failure to meet the applicable standard or legal requirements or policies
- Pole, conductor or guy and anchor failures could impact adjacent structures creating wider-spread failures
- Continued service unreliability

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$65.9**	**$71.1**	**$81.1**	**$2,140.1**
SRP Expenditures	$65.9	$71.1	$81.1	$529.7

3.2 Program Resource Requirements

- Approximately 38,000 priority (score 0 and 1) poles and associated hardware
- Approximately 1,300 linear miles of conductor (score 0 and 1)
- Personnel — 42 × 6 – 7 person crews. More crews will be needed in subsequent years as amount of work grows.

Distribution Pole & Conductor Repair

3.3 Estimating Methods & Assumptions

- Estimates are based on average costs for pole, hardware and conductor replacements from parent company experience.
- Use of internal resources is anticipated but will likely need to be supplemented with contract resources, which may increase average costs.
- Availability of pole, hardware and conductors, as well as manufacturing capacity, could also affect material costs.
- Assumptions: Estimating cost splits based on historical projects.

Category	Percentage
Engineering/PM	5%
Material	29%
Construction/Commissioning	50%
Pre-Construction Field Activities	16%

3.4 SRP Program Timeline & Milestones



Distribution Line Rebuild

1.0 Program Description

This program replaces damaged or ineffective overhead and underground distribution lines. This program includes the following initiatives, a mix of SRP and non-SRP work:

- Perform distribution line upgrades to improve reliability and resiliency
- Restore out of service circuits as deemed necessary
- Complete unfinished circuit construction presently abandoned as deemed necessary
- Perform circuit voltage conversions to improve distribution capacity (non-SRP)
- Build new distribution line extensions to connect new customers (non-SRP)
- Install underground cable and/or tree wiring to improve service reliability and resiliency to critical customers (non-SRP)

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA estimates that approximately 20 percent of the assets comprising overhead, and underground distribution lines require safety and hazard mitigation to reach remediation. Field assessments will categorize assets according to their health, based on estimates of condition (likelihood of failure) and criticality (consequence of failure with an asset score from 0 (worst) to 4 (best). Mitigation of risk related to only the high-risk assets categorized as 0 or 1 will be performed as SRP work. LUMA estimates that approximately 20 percent of the assets comprising the transmission line projects will be assessed as high risk (0 or 1 health score) and will require safety and hazard mitigation to reach remediation. These deficient assets will exhibit the following:

- High risk of failure, or already failed ***and*** likely to cause:
  - A safety impact to the workers or the public,
  - Failure to meet applicable legal requirements or policies, including Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations, or
  - An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

For the reasons mentioned above this program is included in the SRP.

All deficient assets, including those in the SRP will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

LUMA's assessment has identified several areas for improvements, upgrades and replacement of distribution lines and their underlying system. A number of necessary overhead and underground improvements or upgrades to distribution lines have been identified but not yet remediated. As identified

in the Sargent & Lundy report (CS-0017 TD 10 Year Capital Reliability Plan, Section 3.2 Underground Distribution Feeder Replacement Program), about 60% of the underground system has been identified as requiring replacement due to poor conditions and system age (note that it is estimated that approximately 20% of the system fall within the SRP scope requiring safety and hazard mitigation in order to reach the remediated state). Switch cubicles and submersible switches in poor condition have also been identified as needing replacement, along with storm-damaged distribution line transformers that are still operating in the system. 86 distribution feeders or portions thereof (comprising a total of 202 miles) are damaged and currently out of service. Another gap identified was eight feeders that have sections of unfinished construction and are also out of service.

Several new extensions were also identified but have yet to be completed. Similarly, there are systems facing capacity constraints, degraded power quality and excessive conductor losses that will benefit from voltage conversion. Many systems that supply critical loads also require improvements to ensure resiliency and reliability. This will be achieved by undergrounding or installing tree wire.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

High risk findings of the distribution assets, those that have an assessment score of 0 or 1, shall be incorporated into a remediation plan and mitigated. LUMA will take a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

To achieve the remediated state LUMA will have first identified all distribution lines to be repaired and replaced to meet current codes and standards. This work is described and will be performed under the Assessment of Distribution Lines program.

In the remediated state, the distribution line assets identified as high risk with an assessment score of 0 or 1, currently estimated at approximately 20 percent of all transmission poles, structures, and conductors, will have been repaired and replaced to meet current codes and standards, and requirements under Applicable Laws and the OMA. This includes, but is not limited to, the portions of the underground system in unrepairable condition, damaged underground switch cubicles and switchgear, and storm damaged distribution transformers. Regarding the underground system remediation, if FEMA funding is available, the damaged portions will be replaced with new underground cables in line with the National Electrical Safety Code (NESC) requirements.

2.3 Description of Program Completed State

In addition to conditions identified in the remediated state, the program completed state includes:

- New extensions identified and executed
- Removal of capacity constraints due to improper operating voltage by upgrading the system voltage class
- Reinforcement of the system by putting in place either underground cables or overhead tree wire to supply critical loads safely and reliably

Distribution Line Rebuild

- All equipment that has been out of service due to damage repaired and restored to service. Non-energized facilities no longer required will also have been salvaged. All abandoned construction for necessary/needed assets is completed

2.4 Program Activities

- Verify results of studies and assessments justifying the need for improvements, upgrades or replacements on both the overhead and underground segments of the identified feeders
- Prioritize and schedule work based on reliability and condition severity levels
- Complete engineering design/construction plans for each of the projects
- Organize personnel, equipment, and materials, acquire all necessary approvals and put projects out to bid as needed
- Schedule internal resources and/or hire contractors to complete the construction work to:
  - Complete overhead and underground feeder improvement/upgrade projects on feeders with already identified needs
- Reconstruct underground systems near the end of their life and those with major concerns that present safety and reliability issues
- Replace approximately 1,800 distribution line transformers that have failed or may fail due to storm damage
- Address majority of asset performance and condition issues within the first five years of the program, with the rest to be completed thereafter.
- Complete new extension projects on feeders with already identified needs, upgrade voltage class on systems with severe capacity constraints
- Improve the supply continuity and reliability of critical customers by defining a mainline or express feed by either undergrounding or tree wiring portions of their supply feeders
- Repair storm damaged feeders that are currently out of service due to extensive damaged
- Complete abandoned construction on feeders with already identified needs but have yet to be completed

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	

Distribution Line Rebuild

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☒ Restore Damaged Grid Infrastructure	Direct
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Indirect
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Provides a safe workplace by repairing and/or replacing assets that are in poor or damaged condition and could present a safety risk to those working around them (e.g., arc flash) or to the public (e.g., downed infrastructure).

Objective: Implement Effective Public Safety Practices

Implements effective public safety practices by repairing and/or replacing assets in poor or damaged condition, such as damaged pole-top and pad-mounted transformers, that are located near customer facilities.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

Increases service continuity and reliability to customers by replacing and upgrading facilities that have poor reliability performance and by adding and completing facilities that allow for alternate feeds.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

A large portion of this work is expected to be federally funded.

Objective: Restore Damaged Grid Infrastructure

Restores damaged grid infrastructure by replacing and/or restoring assets damaged by storms (such as distribution line transformers, switch cubicles and submersible switchgear) and other assets in poor condition (e.g., cables and switches).

Distribution Line Rebuild

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid

Where practical, replaced assets such as switches will be capable of being incorporated into future distribution automation schemes.

2.6 Program Risks

Risks of delaying or not pursuing this program include:

- Increasing safety hazards for employees and the public as the condition of equipment continues to deteriorate
- Decreasing reliability levels due to increased asset failures, working against achievement of reliability performance targets
- Reliability performance stagnation for critical customers
- Reduced operational flexibility as lines out of service can affect how the system is configured and operated

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$56.4**	**$161.3**	**$422.2**	**$977.1**
SRP Expenditure	$5.0	$7.0	$7.0	$7.0

3.2 Program Resource Requirements

Required resources include:

- 256 pad-mounted and submersible switches
- Approximately 1,800 distribution line transformers
- Approximately 2,100 miles of cable for SRP activities plus those required by planning studies for non-SRP
- Overhead conductors and other materials for the overhead work
- Adequate internal and/or external resources to complete the work
- Overhead materials for non-SRP voltage conversions and SRP upgrades
- Tree-wire as determined by planning studies
- Mobilize personnel and source equipment as required by the specific project

3.3 Estimating Methods & Assumptions

DISTRIBUTION OVERHEAD FEEDER REPLACEMENT/UPGRADES:

As per Necessary Maintenance Expenditure (NME) scope & estimates. Project cost: $115M. $18.4M (2022), 2023-2028 - $15.2M/year. 7-year program with high-priority items addressed within the first five years.

Distribution Line Rebuild

DISTRIBUTION NEW EXTENSIONS:

As per NME scope & estimates. Project cost: $7.98M. 10-year program with high-priority items addressed within the first five years.

UNDERGROUND FEEDER REPLACEMENTS/UPGRADES:

As per NME scope & estimates, total project cost: $44M.

10-year program with high-priority items addressed within the first five years.

DISTRIBUTION CABLE REPLACEMENT:

Cost: $750,000 per mile (as per S&L), total program cost $1.026B.

15-year program with high-priority items addressed within the first five years.

VOLTAGE CONVERSION PROGRAM:

Cost: Allocation of $100M for the entire program, which allows converting strategically selected feeders.

10-year program with high-priority items addressed within the first five years.

FEEDER UNDERGROUNDING OR TREE-WIRING:

Cost: $ Allocation of $350M for the entire program, which allows undergrounding or tree-wiring selected feeders that supply critical loads.

10-year program with high-priority items addressed within the first five years.

UNDERGROUND SWITCH REPLACEMENTS:

Cost: 256 switches × $300k / switch. Includes labor. $7.6M / year for 10 years. Project cost 10 × $7.6M = $76M.

10-year program with high-priority items addressed within the first five years.

DISTRIBUTION LINE TRANSFORMER REPLACEMENT COSTS:

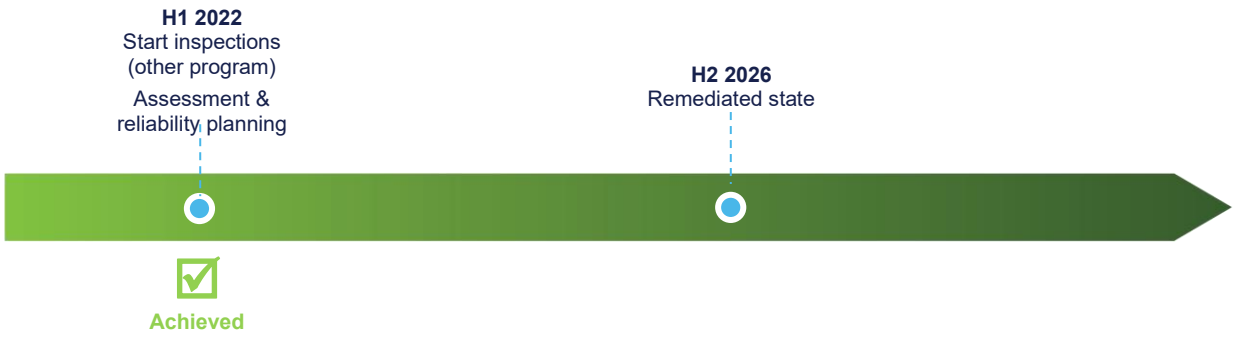
$16,800/ transformer × 1,812 transformers = $316M. project cost. $31.6M/yr. over 10 years. 10-year program with high-priority items addressed within the first five years.

LUMA has provided estimates for the different projects assuming ±30% accuracy except FEMA-funded projects and NME projects.

Category	Percentage
Engineering/PM	15%
Material	29%
Construction/Commissioning	45%
Pre-Construction Field Activities	11%

Distribution Line Rebuild

3.4 SRP Program Timeline & Milestones



Distribution Automation

1.0 Program Description

This program (Distribution Automation) is not part of the SRP but does focus on establishing equipment for distribution automation. This includes the installation intelligent switches fuses, fault indicators, and reclosers on select feeders (including main line and feeder ties) to reduce the number of customer interruptions per outage occurrence.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Initial assessment has identified the following issues:

- The distribution system is not in alignment with regulation/law, specifically Act 17, Subsection 1.15 (o).
- Inadequate or insufficient technology employed in the distribution system to improve system reliability, resulting in higher costs to the customers. Customers presently face energy costs significantly above the US average.
- Feeders do not have in-line protective devices to reduce the number of customer interruptions per outage occurrence.

Reliability performance metrics – current reliability performance is very poor (in the fourth quartile).

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

The program will have achieved a completed state when it successfully establishes:

- Intelligent switches and a FLISR system deployed on approximately 50% of feeders, ordered by poorest reliability performance. This includes the installation of line segmentation/protection devices midline and on the secondary of distribution step-down substations (i.e., town/rural substations), cutout mounted protective devices, and fault indicators.
- Prioritization and selection of feeders to be determined by the distribution system assessments, which are performed under a separate program.

2.4 Program Activities

- Studies to determine optimal locations for intelligent switches and reclosers
- Studies to determine Volt VAR Regulation/Optimization (VVO) feeders and location of assets, such as capacitors and regulators, on these feeders

Distribution Automation

- Deployment of intelligent switches, reclosers, capacitors, regulators and other assets as per the studies
- Deployment of FLISR and fault indicators systems as per the studies
- Tracking of reliability performance improvement, reduced system losses and customer consumption savings due to the added technology

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Direct
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☒ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Direct
	☒ Enable the Digital Transformation	Direct
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Increase Service Reliability

Enables rapid isolation of system faults and isolation of customers not directly on the faulted section of line, thereby improving system reliability and customer experience.

Distribution Automation

Objective: Deliver Electricity at Reasonable Prices

VVO reduces line losses, which reduces the cost of electricity.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

Distribution automation assets contribute to having real-time and historical system performance data, which enables systematic management of the business and systemic operations for employees.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

Intelligent switches and automation facilitate system restoration during contingencies and disasters.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid
Objective: Enable the Digital Transformation

The system visibility, control and data provided by distribution automation assets are a key part of a modern digital grid.

2.6 Program Risks

- The primary risk of delay or lack of implementation is continued poor reliability performance.
- Note that this program has several interdependent programs (e.g., line assessments, device installations, ADMS, communication infrastructure) that must be completed for this effort to be successful.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$35.6**	**$53.5**	**$53.5**	**$253.3**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

- Approximately 2,000 intelligent switches (overhead and underground), 500 capacitors and 70 regulators on lines — exact quantities To Be Determined (TBD) from detailed studies. Sufficient field radios to service these devices.
- Approximately 250 data concentrators, one per substation. Load tap changer or regulator installed at approximately 47 substations.
- Approximately 1,500 reclosers, 75,000 cut-out mounted tripsavers, fault indicators.

- Sufficient human resources to carry out the specified studies and projects.

3.3 Estimating Methods & Assumptions

For intelligent switches, a high-level estimate was performed by analyzing feeders to calculate how many intelligent switches on the feeder would yield a cost-benefit ratio of $2 /Customer Minute Interrupted (CMI) or better. These include feeder ties, underground and overhead. For the purposes of this study, customers and outages were assumed to be evenly distributed. Also, it is assumed that it will be required to install one mid-stream overhead recloser for each feeder with significant overhead mileage. Budgeted approximately 1.5 reclosers, 75 cut-out mounted protective devices (trip savers), and five sets of 3 Fault Indicators per line. After accounting for these assumptions, the number of overhead and underground switches was multiplied by unit costs to generate the estimate.

The following labor vs material splits were assumed:

Category	Labor	Materials
Overhead	61%	39%
Underground	28%	72%
Data Concentrators	25%	75%
Last-Mile Telecom	50%	50%

Distribution Lines Assessment

1.0 Program Description

This program (Distribution Lines Assessment) is targeted at the assessment, testing, and studying of distribution lines, along with required spot repairs and replacements. Distribution line assessments will first be prioritized by worst performing feeder and highest criticality with the initial assessment focusing on the identification of SRP items. Because of the magnitude of the work, the SRP portion of the assessment program is anticipated to take four years to complete with the remainder of assessments to be completed after the SRP period.

Its aim is to help to restore the system and improve reliability and resiliency in line with current codes and standards, including, but not limited to:

- Inspecting and treating poles
- Performing ground rod assessments and minor repairs / replacements
- Inspecting and replacing anchors and guys
- Inspecting conductor condition
- Performing line clearance checks to ensure that distribution assets meet live line clearance requirements under the applicable codes and standards
- Assessment of streetlight heads and poles
- Identification of third-party attachments
- Assessment of third-party attachments for applicable code violations as it pertains to the electrical system

The identified major repairs and replacements will then be undertaken by a separate program.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

PREPA did not have a comprehensive health assessment of the distribution system. In recent years, PREPA did not conduct programed pole line assessments (including streetlights). As a consequence, the condition of the distribution field assets was basically unknown and not documented. It is apparent to experienced LUMA utility engineers from visual observations, site visits and an asset health sampling that there exist widespread deficiencies in the distribution system. Field assessments will categorize assets according to their health, based on estimates of condition (likelihood of failure) and engineers will assess criticality (consequence of failure) and assign an asset score from 0 (Worst) to 4 (best). Mitigation of risk related to only the highest risk assets will be categorized and performed as SRP work. These will be assets that exhibit the following:

- High risk of failure, or already failed
- *and* likely to cause:
  - A safety impact to the workers or the public,

Distribution Lines Assessment

- Failure to meet applicable legal requirements or policies, including Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations, or
- An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

LUMA estimates that approximately more than 20 percent of the assets comprising overhead, and underground distribution lines (including streetlights) require safety and hazard mitigation to reach remediation.

PREPA did not have accurate records of third-party attachments to their poles and had not performed loading analysis for those poles, especially those with multiple third-party attachments.

For the reasons mentioned above, this program is included in the SRP.

All deficient assets, including those in the SRP will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

Initial analysis uncovered the following issues:

- Distribution structures that are not compliant with laws and regulations and safety codes, specifically Act 17
- Anchors and guys needing to be reinforced or replaced. It was known that a large proportion of them need some form of remediation work, but there was no exact data on which ones need improvement
- A frequency of forced outages much higher than industry norms
- Lines lacking design capacity and need restoration
- Insufficient records of what equipment is damaged, the nature of the damage, and its location.
- Very few planning studies and feeder analyses were done, and the capabilities/weaknesses of most circuits were unknown

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, an organized field assessment program of main lines to assess the condition of the asset and then assess the criticality (consequence of failure) will have been completed. Mitigation of risk related to only the highest risk assets (i.e., those scoring a 0 or 1 on the previously mentioned scale of 0 to 4), currently estimated at 20 percent, will have been repaired and replaced to meet current codes and standards, and requirements under Applicable Laws and the OMA.

The asset score will be documented, and high-risk findings shall be incorporated into a remediation plan that will take into account a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

Distribution Lines Assessment

In the remediated state, the main lines of the distribution system will have been visually inspected. The hazard, safety and reliability issues that have been identified through this assessment will have been logged and prioritized.

In addition, in the remediated state, the third-party attachments have been identified and contact has been established with the third-party attachment owners to assure resolution of problems and begin discussions on the correct attachment fees. Loading analysis have been performed on those poles with multiple third-party attachments or those that appear to be overloading the pole and discussion with the third-party owners have been initiated to resolve any problems.

2.3 Description of Program Completed State

In addition to what has been noted for the remediated state, the program completed state includes:

- Continued time-based assessment of the distribution system including non-main lines
- Identification of system components to be replaced, such as poles, with Engineering being informed of the prioritized findings
- Completion of remaining non-urgent assessments of the overhead and underground systems
- Completion of planning studies and reliability assessments of all feeders
- Third party attachments have been identified, any pole loading issues caused by these attachments have been resolved and third-party attachments are not made without following proper established procedures

2.4 Program Activities

- Create detailed plan and complete assessment of the distribution system within the first five years
- Identify and plan high risk failure items or high-potential safety issues on both overhead and underground feeders in restricted access areas or within public access to be remediated within the first three years
- Identify and plan high risk failure items or high potential safety issues involving grounding, anchors, guying, clearance, etc. on all feeders in vulnerable areas or within public access to be remediated
- Spot repair of imminent deficiencies such as ground line treatment, anchor and ground rod replacement
- Completion of planning studies and near-term reliability assessments for the 75 – 100 worst performing circuits (performance measured on an annual basis) within the first three years
- Identification of midline reclosers and other reliability enhancing devices to be installed within the first five years
- Complete planning and reliability assessments for all feeders. Beyond this point, complete planning studies and additions to improve equipment reliability as needed due to load changes and feeder reconfiguration

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

Distribution Lines Assessment

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Indirect
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect
☐ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Indirect
	☒ Enable the Digital Transformation	Direct
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

The program will promote field personnel and public safety by identifying for mitigation potential safety hazards due to poor equipment conditions on both the overhead and underground systems.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

This program will improve service reliability by identifying damaged equipment requiring mitigation and identifying key locations that would benefit from segmentation/protective and other reliability improvement devices on both the overhead and underground feeders.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Distribution Lines Assessment

Objective: Pursue Project Delivery Excellence

The collection of data as part of this program will provide the basic information required to execute system planning and asset management systematically. The data will support the identification of projects and lead to data driven investment decisions.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

A portion of this program is expected to be federally funded.

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

The program will facilitate system rebuild and improved resiliency by identifying damaged poles, hardware and conductors for follow-up replacement.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid
Objective: Enable the Digital Transformation

The data collected will provide valuable information for decision making with respect to grid modernization. The data will also be used to comply with requirements under the integrated distribution planning principles docket.

2.6 Program Risks

Delaying or not performing this program compromises the ability to adequately perform subsequent repair and replacement work, which include risks such as:

- Lack of compliance with regulations/law — Act 17: Failure to maintain the electric power infrastructure to ensure reliability, resilience and safety for utility workers and the public
- Inability to reach reliability targets under Performance Metrics; failure to meet the required reliability targets set forth in the LUMA's contract
- Potential additional liability exposure to the company

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$21.2**	**$19.9**	**$19.9**	**$139.5**
SRP Expenditures	$21.2	$19.9	$19.9	$19.9

3.2 Program Resource Requirements

- Adequate resources to complete the field work, likely a combination of internal and contractor resources

Distribution Lines Assessment

- Three junior engineers to complete the planning and reliability studies

3.3 Estimating Methods & Assumptions

- Estimates based on average cost for pole and line assessments derived from previous experience
- LUMA anticipates using internal resources but will likely need to be supplemented with contract resources, which may increase average costs
- Assessment and planning studies cost: $0.2M per year for two full-time engineers

3.4 SRP Program Timeline & Milestones



C.3 Transmission Portfolio

Transmission assets damaged by Hurricanes Irma and Maria received temporary emergency repairs to quickly restore service. FEMA has allocated nearly $2 billion for further permanent repairs and/or replacement of these assets, to upgrade them to current codes and standards. LUMA's Transmission portfolio is comprised of a set of "Recovery" programs to complete these system hardening upgrades including rebuilding towers, reinforcing anchors, and replacing poles and associated hardware and conductors. The transmission portfolio also includes significant investments in telecom backbone modernization which will help to enable Transformation. Table C-4 below presents a summary of the program spending for the largest programs in the transmission portfolio, followed by a short description of each program.

Table C-5. Transmission Portfolio Spending Estimates by Program ($ million, real)

	FY2023				FY2024	FY2025
Transmission Programs	**Federal Funded Capital**	**Non-Federal Funded Capital**	**OpEx**	**Total Spend Estimate**	**Total Spending Estimate**	**Total Spending Estimate**
Transmission Line Rebuild	85	-	-	85	232	314
IT OT Telecom Systems & Network	32	-	0	32	39	51
Transmission Priority Pole Replacements	6	-	-	6	6	6
Assessment of Transmission Lines	3	0	-	3	3	3
Grand Total	**126**	**0**	**0**	**127**	**279**	**374**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

Transmission Line Rebuild. This program includes numerous 230 kV, 115 kV, and 38 kV projects to harden and upgrade the transmission system. This includes rebuilding towers along with reinforcing and replacing anchors and guys as required over the course of the upgrade process. This program also incorporates an investigation to mitigate corrosion and restore line design capacity. In addition to the overhead transmission line upgrade work, this program includes the 115 kV underground cable addition in the San Juan area.

IT OT Telecom Systems & Networks. This program includes IT and OT telecom investments to improve and revamp PREPA's mobile radio system, phone exchange and telephone systems and fiber optic and microwave data radio systems. These systems are used to carry all PREPA IT and OT data. Capability enhancements will include improved first responder and emergency response communication, greater resilience of the internal telecommunications network, an enhanced microfiber network and network control center to improve centralized monitoring and control over facilities and IT traffic.

Transmission Priority Pole Replacements. This program is to replace damaged overhead transmission poles and towers, along with associated hardware and conductors. Repairs under this program will be made based on results of an assessment conducted under the Assessment of Transmission Lines

program. Major repairs and replacement will be based upon the results of the assessment of the transmission system and an analysis by engineers to schedule the repair or replacement based on the criticality of the pole or structure. Following this process, safety /hazard and priority poles and structures will be replaced, along with damaged conductor and hardware.

Assessment of Transmission Lines. This program includes the assessment, data collection, testing of the Transmission Lines. Required repairs and replacements will be identified in order to restore the system and improve reliability and resiliency in line with current codes and standards. Assessments will include, but are not limited to, poles, towers and structures, ground rods, anchors and guys, conductor condition and line clearance checks. During this process, the program will also incorporate minor repairs, but major repairs will be undertaken by a separate program.

Transmission Line Rebuild

1.0 Program Description

This program includes numerous 230 kV, 115 kV and 38 kV projects to harden and upgrade the transmission system. This includes rebuilding towers along with reinforcing and replacing anchors and guys as required over the course of the upgrade process. This program also incorporates an investigation to mitigate corrosion and restore line design capacity. In addition to the overhead transmission line upgrade work, this program includes the 115 kV underground cable addition in the San Juan area.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Field assessments (conducted under the Assessment of Transmission Lines program) will categorize assets according to their health, based on estimates of their condition (likelihood of failure) and criticality (consequence of failure) and assign an asset score of 0 (worst) to 4 (best). Mitigation of risk related to only the high-risk assets categorized as 0 or 1 will be performed as SRP work. LUMA estimates that approximately 10 percent of the assets comprising the transmission line projects will be assessed as high risk (0 or 1 health score) and will require safety and hazard mitigation to reach remediation. These deficient assets will exhibit the following:

- High risk of failure, or already failed
- *and* likely to cause:
  - A safety impact to the workers or the public.
  - Failure to meet applicable legal requirements or policies, including the T&D OMA, Annex I, Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations.
  - An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

Initial assessments performed to date have identified the following gaps related to transmission lines:

- Anchors and guys need to be reinforced or replaced. It is known that a large proportion of them need some form of remediation work, but there is no exact data on which ones need improvement.
- Transmission infrastructure is corroded in places, though again an investigation is needed to provide exact data on where to provide corrosion mitigations.
- The frequency of forced outages is much higher than US mainland industry norms.
- Lines are operating below design capacity and need restoration.
- Hardening of San Juan area 115 kV grid is required to withstand critical loads. U/G line additions are set out as part of the Modified Action Plan in the approved 2020 IRP.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

Transmission Line Rebuild

2.2 Description of Remediated State

High risk findings of the transmission assets, those that have an assessment score of 0 or 1, shall be incorporated into a remediation plan and mitigated. LUMA will take a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

To achieve the remediated state LUMA will have first identified all transmission lines to be repaired and replaced to meet current codes and standards. This work is described and will be performed under the Assessment of Transmission Lines program.

In the remediated state, the transmission line assets identified as high risk with an assessment score of 0 or 1, currently estimated at approximately 10 percent of all transmission poles, structures and conductors, will have been repaired or replaced to meet current codes and standards, and requirements under Applicable Laws and the OMA.

2.3 Description of Program Completed State

More specifically, all transmission towers will be able to withstand 150 mph winds and thus align with Act 17, Articles 1.15(a), (b) and (c) which require, in addition to the wind resistance standard, the replacement of temporary transmission towers by single poles and poles with material to prevent overload, replacement and maintenance of transmission infrastructure anchoring systems to maintain resiliency, and implementation of programs to mitigate corrosion in grid infrastructure.

Further, the transmission system will operate with infrastructure of the highest standards, and industry standard maintenance programs will ensure reliability levels are maintained. The San Juan area 115 kV network will be able to withstand N-1 outage criteria without load loss due to transmission forced outages.

2.4 Program Activities

Completion of the following priority projects:

- Rebuild towers to current standards (230 kV)
- Assessment / reinforcement / replacement of anchors / guys / foundations
- Corrosion mitigation investigation to make the transmission system safer and more resilient with subsequent mitigations against identified corrosion
- Compliance — safe operation of grid from avoidance of structure failures and conductor clearance conflicts
- Review pole/structure assessment data collected during the Transmission Assessment Program and other sources to avoid duplication of work already completed
- Replace safety hazard poles/structures and associated hardware
- Replace priority poles/structures and associated hardware (115 kV, 38 kV)
- Replace damaged conductors

- Restoration of line design capacity (non-SRP)
- Creation of new 115 kV underground paths in the San Juan metro area to improve reliability and maintain critical load support. Terminal additions at affected substations are also required. This will allow generation at Palo Seco and San Juan to better supply the area load following major storm events (non-SRP).

Transmission Line Rebuild

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	Enable the Sustainable Energy Transformation	Direct
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Improvement to anchors, insulators and conductors will harden the system to prevent failures and improve operating conditions for employees, allowing them to work in safety.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

Rebuilt and replaced infrastructure will improve the system's ability to withstand the impact of transmission forced outages.

Objective: Deliver Electricity at Reasonable Prices

Transmission Line Rebuild

Additional line paths described in approved IRP allow for more efficient and reliable supply of electricity, helping to keep prices reasonable.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Employees to Execute Operations Systematically

Improvement to anchors, insulators and conductors will harden the system to prevent failures and improve operating conditions for employees, allowing them to complete work without interruption. Improved resilience provides additional operational flexibility to the system, reducing the need for non-routine operations to be run by employees.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure

Replacement of line elements helps to restore the grid's performance as a whole by providing functioning infrastructure.

Objective: Improve Resilience of Vulnerable Infrastructure

Towers rebuilt to 150 mph standard will reduce tower failures. Given the climate in Puerto Rico, the strength of towers against high winds is of particular importance and a key vulnerability if not properly addressed. Improved transmission (N-1 and N-1-1) capacity will reduce the impact of forced outages, improving overall system resilience.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Enable the Sustainable Energy Transformation

Additional line paths described in the approved IRP will have a more sustainable design, helping to transform the overall system.

2.6 Program Risks

If this program is either delayed or not carried out, the main risks to the system are the following:

- Safety risk associated with the operation of damaged equipment
- Continued forced outages due to damaged structures and equipment
- Continued forced outages due to reduced design capacity and difficulties in operating in contingency (N-1 and N-1-1) scenarios

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$85.3**	**$231.8**	**$313.8**	**$1,083.6**
SRP Expenditures	$83.1	$217.6	$305.7	$882.2

Transmission Line Rebuild

3.2 Program Resource Requirements

- Adequate resources to complete the work are likely a combination of internal and contractor resources.
- Construction resources to complete the line projects will likely be contractor including resources from outside Puerto Rico. Commissioning and handover will be done using internal resources.

3.3 Estimating Methods & Assumptions

230 kV line rebuilds: Average cost $809,000 per mile. $25,124m in year one including labor. Average of $33.7m/year for subsequent years. 10-year program with high priority items addressed within the first three years. Unit pricing breakdown for 100% replacement of components (per mile):

- Structures: $495,000
- Conductor: $537,000
- Insulators/Hardware: $119,000
- Anchors/Foundations: $249,000

115 kV overhead line rebuilds: Average cost $791,000 per mile. $31,574m in year one including labor. Average of $44.1m/year for subsequent years. 10-year program with high priority items addressed within the first three years. Unit pricing breakdown for 100% replacement of components (per mile):

- Structures: $216,000
- Conductor: $508,000
- Insulators/Hardware: $151,000
- Anchors/Foundations: $166,000

San Juan area 115 kV underground line additions: Estimates referenced from IRP.

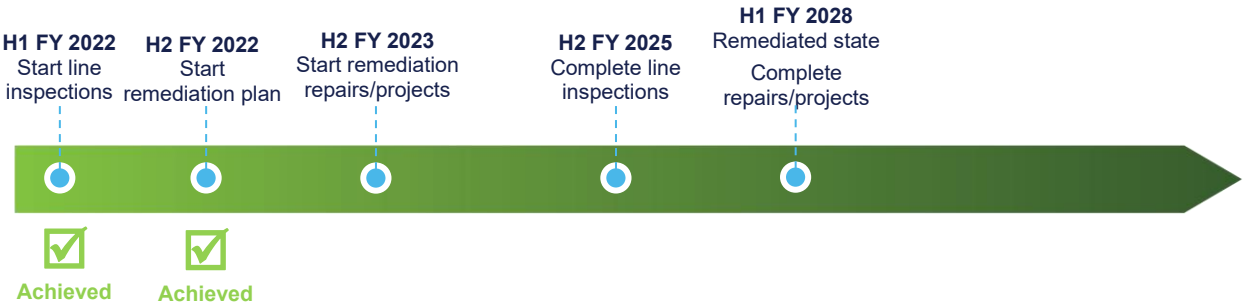
38 kV line rebuilds: Average cost $1.172m per mile. $80m year in one including labor. Average of $121.3m/year for subsequent years. 10-year program with high priority items addressed within the first three years. Unit pricing breakdown for 100% replacement of components (per mile):

- Structures: $739,000
- Conductor: $500,000
- Insulators/Hardware: $528,000
- Anchors/Foundations: $352,000

Category	Percentage
Engineering & Admin	3%
Material	24%
Pre-construction Activities	26%
Construction & Commissioning	47%

Transmission Line Rebuild

3.4 SRP Program Timeline & Milestones



IT OT Telecom Systems & Networks

1.0 Program Description

This program includes IT and OT telecom investments to improve and revamp PREPA's mobile radio system, phone exchange and telephone systems and fiber optic and microwave data radio systems. These systems are used to carry all PREPA IT and OT data. Capability enhancements will include improved first responder and emergency response communication, greater resilience of the internal telecommunications network, an enhanced microfiber network and network control center to improve centralized monitoring and control over facilities and IT traffic.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

REDACTED

REDACTED

REDACTED

IT OT Telecom Systems & Networks

REDACTED

2.1.1 Additional Gaps Identified Post-Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

IT OT Telecom Systems & Networks

REDACTED

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

REDACTED

IT OT Telecom Systems & Networks

REDACTED

2.4.1 Additional Activities Identified Post-Commencement

REDACTED

2.5 Program Benefits

REDACTED		

IT OT Telecom Systems & Networks

REDACTED

IT OT Telecom Systems & Networks

REDACTED

2.6 Program Risks

REDACTED

IT OT Telecom Systems & Networks

REDACTED

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$32.4**	**$38.5**	**$51.3**	**$521.2**
SRP Expenditure	$32.4	$38.5	$51.3	$253.3

3.2 Program Resource Requirements

Contractors will be required for all of the programs. It is not expected that LUMA will have enough internal resources with skill and equipment to complete this work in a timely manner. For example, bucket trucks and fusion splicers will be required to repair the OPGW fiber, and enough of these resources are not available without being supplemented by contractors. Access roads might have to be cleared again requiring contractor expertise.

Engineers, integrators, network technicians and contractors will be required for the deployment of DWDM, IP/MPLS, LMR system and other communications technologies. Integration of systems and system integration is key and vendors or certified specialists have better experience to deploy these systems in a timely and effective manner.

3.3 Estimating Methods & Assumptions

LUMA has reviewed and ascertained that PREPA's cost estimates for this program are reasonable.

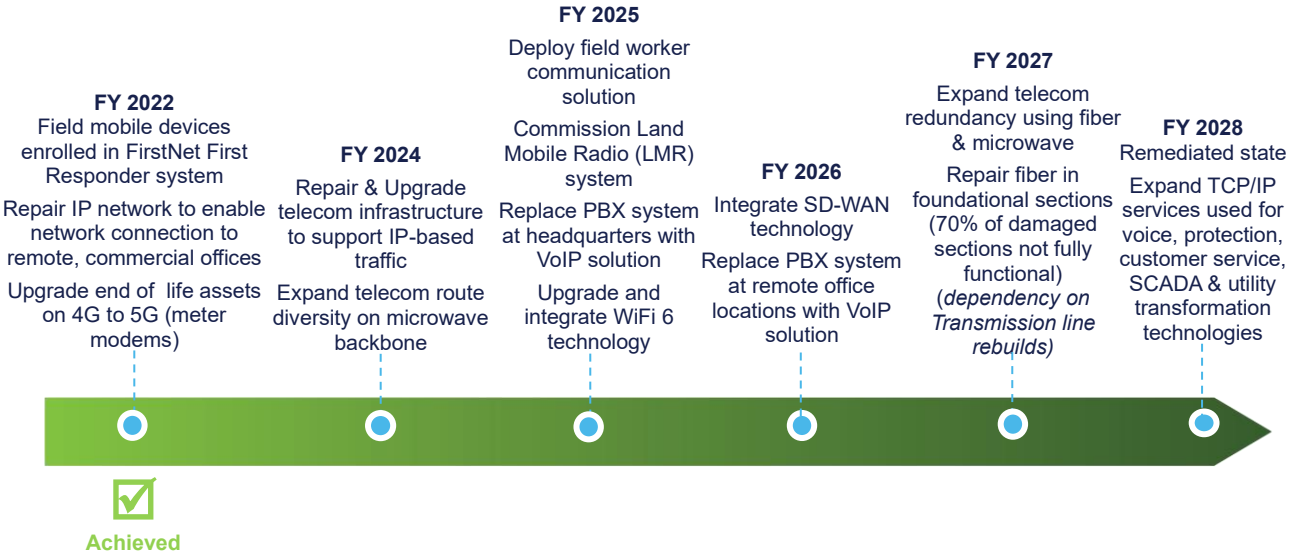
Further verification of funding was done using IBM and additional LUMA and parent company resources.

It is assumed that LMR (P25 or equivalent) will remain the leader in first responder technologies and will not be replaced by 5G.

It is assumed that all programs will be built using the LUMA Telecom Design Control Document (DCD) and all its associated standards and requirements.

IT OT Telecom Systems & Networks

3.4 SRP Program Timeline & Milestones



Transmission Priority Pole Replacements

1.0 Program Description

This program (Transmission Priority Pole Replacements) is to replace damaged overhead transmission poles and towers, along with associated hardware and conductors. Repairs under this program will be made based on results of an assessment conducted under the Assessment of Transmission Lines program. Major repairs and replacement will be based upon the results of the assessment of the transmission system and an analysis by engineers to schedule the repair or replacement based on the criticality of the pole or structure. Following this process, safety /hazard and priority poles and structures will be replaced, along with damaged conductor and hardware.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA has determined that a large quantity of transmission poles need to be repaired or replaced. The number of wood/concrete structures that would need replacement is undetermined. Field assessments performed in the Assessment of Transmission Lines program will categorize assets according to their health, based on estimates of condition (likelihood of failure) and criticality (consequence of failure) and assign an asset score of 0 (worst) to 4 (best). Mitigation of risk related to only the highest risk assets will be categorized and performed as SRP work. LUMA estimates that approximately 25 percent of the transmission poles are within the high-risk category (0 or 1) and will require replacement to reach remediation.

These deficient assets will exhibit the following:

- High risk of failure, or already failed
- *and* likely to cause:
  - A safety impact to the workers or the public.
  - Failure to meet applicable legal requirements or policies, including Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations.
  - An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

All deficient assets, including those in the SRP, will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

This program will mitigate safety risks to field workers and the public by replacing poor condition poles and associated hardware and conductors that have a high risk of failure. LUMA's assessment has confirmed that a large percentage of transmission poles, hardware and conductors are in poor condition, possibly due to damage from severe weather events and age. The condition of poles and associated hardware pose a safety risk to field workers and the public. Timely replacement of safety priority poles

Transmission Priority Pole Replacements

and associated hardware and conductors will contribute to the safe operation of the grid by reducing potential asset failures, addressing conductor clearance issues, and reducing arc-flash risks.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

High risk findings of transmission poles or structures, those that have an assessment score of 0 or 1, shall be incorporated into a remediation plan and mitigated. LUMA will take a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

To achieve the remediated state LUMA will have first identified all transmission poles, structures, and conductors to be repaired and replaced to meet current codes and standards, as described in the Assessment of Transmission Lines program.

In the remediated state, those identified high risk assets with an assessment score of 0 or 1, currently estimated at approximately 25 percent of all poles, will have been repaired or replaced to meet current codes and standards, and requirements under applicable laws and the OMA.

2.3 Description of Program Completed State

In the program completed state:

- Safety hazard transmission poles, associated hardware and conductors identified in the assessment process program will have been repaired or replaced system wide.
- Remaining priority (poor condition) poles/structures and associated hardware and conductors will have been repaired or replaced within one year after they are identified through the assessment process program.

2.4 Program Activities

- Compiling pole/structure assessment data from various sources to avoid duplication of work already completed
- Performance of health assessments to ensure proper prioritization and focus on high-risk items
- Completion of engineering design/construction plans for each of the projects
- Organizing personnel, equipment, and materials, acquiring all necessary approvals, and putting projects out to bid as needed
- Replacement of all safety / hazard and priority wood poles at 115 kV and a majority of the 38 kV wood poles on the island with new poles meeting wind load requirements. This includes:
  - Improved embedment techniques to resist structure uplift in high wind events
  - Upgrade of insulators and hardware to components meeting wind load and contamination requirements
  - Restoration of sky wires and structure grounding/bonding
  - Replacement of damaged conductor with that appropriately sized and having necessary tensile strength for anticipated wind loads
  - Addressing anchor corrosion and tension issues to restore/improve anchoring systems to meet wind load criteria

Transmission Priority Pole Replacements

- Repair of compromised lattice structures through member replacements, correcting bolt deficiencies and torquing all connections to specification
- Selective upgrade of structures at all voltages to improve anti-cascading performance of line segments in high wind zones

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

The program increases field worker and public safety by repairing and/or replacing poor condition poles and associated hardware and conductors that have a high risk of failure. Those failures could otherwise present a safety risk to those working near them (e.g. arc flash) or to the public (e.g. downed infrastructure).

Transmission Priority Pole Replacements

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

The program increases service continuity and reliability to customers by replacing and upgrading facilities that have poor reliability performance and by adding/completing facilities that allow for alternate feeds.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

This work will be carried out with a large portion of the federal funds allocated for the rebuilding of the system. LUMA will make efficient use of these funds for this crucial aspect of system rebuild.

Objective: Restore Damaged Grid Infrastructure

The program replaces poles and associated hardware and conductors that are in poor condition due to damage from severe weather events and aging.

Objective: Improve Resilience of Vulnerable Infrastructure

Poles will be replaced with higher strength wooden poles, concrete, steel, resin, or other types of poles that will increase resiliency to harsh weather conditions.

2.6 Program Risks

Risks of delaying or not pursuing this program include:

- Increasing safety hazards for employees and the public as the condition of equipment continues to deteriorate.
- Decreasing reliability levels due to increased asset failures, working against achievement of reliability performance targets.
- Reliability performance stagnation for critical customers.
- Reduced operational flexibility as lines out of service can affect how the system is configured and operated.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$6.0**	**$6.0**	**$6.0**	**$479.9**
SRP Expenditures	$6.0	$6.0	$6.0	$105.6

SRP total expenditure = $182.3m. Based on the estimate that 25% of findings will be high risk. Hence, 25% of the total program expenditure of $729.2m = $182.3m.

Transmission Priority Pole Replacements

3.2 Program Resource Requirements

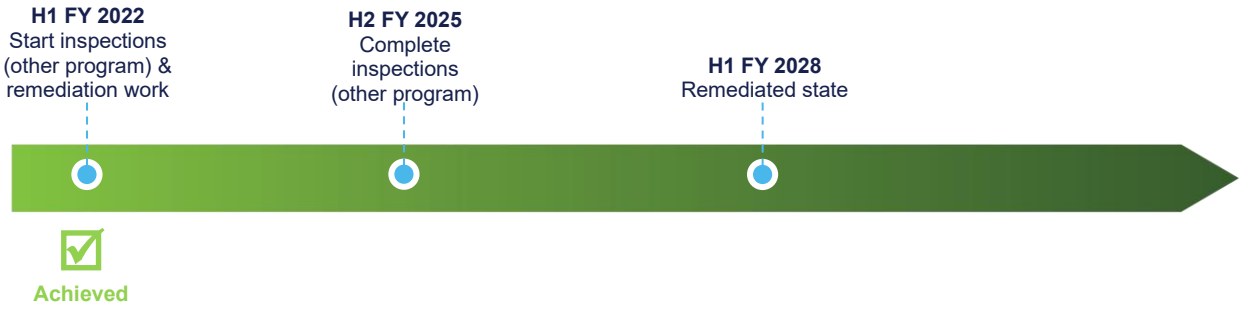
- Approximately 8,100 structures and associated hardware/conductor for 10,000 structures falls into this work scope.
- Work expected to be mainly performed by on-island resources.

3.3 Estimating Methods & Assumptions

- Estimate based on average cost for pole, hardware, and conductor replacements from previous experience.
- Anticipate using internal resources but will likely need to supplement with contract resources, which may increase average costs.
- Availability and manufacturing capacity of poles, hardware and conductors could also affect material costs.

Category	Percentage
Engineering & Admin	10%
Material	24%
Pre-construction Activities	19%
Construction & Commissioning	47%

3.4 SRP Program Timeline & Milestones



Assessment of Transmission Lines

1.0 Program Description

This program includes the assessment, data collection, testing of the Transmission Lines. Required repairs and replacements will be identified in order to restore the system and improve reliability and resiliency in line with current codes and standards. Assessments will include, but are not limited to, poles, towers and structures, ground rods, anchors and guys, conductor condition and line clearance checks. During this process, the program will also incorporate minor repairs, but major repairs will be undertaken by a separate program.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

PREPA does not have a health assessment of the transmission system. In recent years, PREPA has not conducted programed transmission line assessments. Consequently, the condition of the transmission field assets is basically unknown and not documented. It is apparent to experienced LUMA utility engineers from casual visual observations, site visits and an asset health sampling that there are widespread deficiencies in the transmission system. Field assessments will categorize assets according to their health, based on estimates of their condition (likelihood of failure) and criticality (consequence of failure) and assign an asset score from 0 (worst) to 4 (best). Mitigation of risk related to only the highest risk assets will be categorized and performed as SRP work. Note that these assessments also include identifying and surveying all high potential safety or imminent failure issues involving grounding, anchors, guying, clearance, etc. all transmission lines in vulnerable areas and/or within public access (high risk).

These deficient assets will exhibit the following:

- High risk of failure, or already failed
- *and* likely to cause:
  - A safety impact to the workers or the public.
  - Failure to meet applicable legal requirements or policies, including the T&D OMA, Annex I, Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations
  - An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

Sargent and Lundy estimates that approximately 22,500 poles (52% of total wood / concrete poles) may require replacement and recommends a pole assessment program to determine the actual number. LUMA estimates that approximately 25 percent of the assets will be assessed as high-risk (0 or 1 health score) and will require safety and hazard mitigation to reach remediation. These include both overhead and underground transmission lines.

For the reasons listed the majority of the work above is included in the SRP.

Assessment of Transmission Lines

All deficient assets, including those in the SRP, will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

Compared to prudently operated utilities, a disproportionately large percentage of the transmission system has deficiencies possibly due to damage from severe weather events and aging.

Initial assessments have uncovered the following issues:

- Anchors and guys need to be reinforced or replaced. It is known that a large proportion of them need some form of remediation work, but there is no exact data on which ones need improvement.
- Transmission infrastructure is corroded in places, though again an investigation is needed to provide exact data on where to provide corrosion mitigations.
- The frequency of forced outages is much higher than US mainland industry norms.
- Line designed capacity is currently lacking and needs restoration.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

High risk findings of the transmission assets, those that have an assessment score of 0 or 1, shall be incorporated into a remediation plan. LUMA will take a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

To achieve the remediated state LUMA will have first identified all transmission lines to be repaired.

In the remediated state, the transmission line assets identified as high risk with an assessment score of 0 or 1 will have been identified for repair or replacement to meet current codes and standards, and requirements under Applicable Laws and the OMA. High risk transmission line assets are currently estimated at approximately 25 percent of all transmission poles, structures and conductors.

2.3 Description of Program Completed State

In addition to what has been noted for the remediated state, the program completed state includes:

- Continued time-based assessment of the transmission system, with minor repairs being completed alongside
- Identification of system components to be replaced, with engineering being informed of the prioritized findings
- Completion of remaining non-urgent identified equipment issues on the overhead and underground lines
- Completion of line clearance checks to ensure that transmission assets meet live line clearance requirements of the applicable codes and standards

Capital projects, such as priority pole and conductor replacements, are under separate programs.

Assessment of Transmission Lines

2.4 Program Activities

- Create detailed plan and complete assessment of the transmission system within the first five years
- Identify and plan imminent failure items or high potential safety issues on overhead transmission systems in restricted access areas or within public access to be remediated within the first five years
- Identify and plan imminent failure items or high potential safety issues involving grounding, anchors, guying, clearance, etc. on all lines in vulnerable areas or within public access to be remediated
- Prioritize new work identified in the assessment process (non-SRP)
- Identify any new safety and security issues, and other quick wins, in the near term
- Schedule remaining work to be completed on a coordinated circuit and/or geographic basis (non-SRP)

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Indirect
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Indirect
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☒ Restore Damaged Grid Infrastructure	Indirect
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect
☐ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Indirect
	☒ Enable the Digital Transformation	Indirect
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

Assessment of Transmission Lines

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

The program will promote field worker and public safety by addressing potential safety hazards such as poor grounding, loose anchors and guying, conductor condition and line clearance issues.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

The program will indirectly promote customer satisfaction by identifying repairs that will improve service reliability.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Pursue Project Delivery Excellence

The collection of data as part of this program will provide the basic information required to execute system planning and asset management systematically. The data will support the identification of projects and lead to data driven investment decisions.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

The program will indirectly improve service reliability by identifying damaged poles, hardware and conductors for follow up replacement, facilitating system rebuild and improved resiliency.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid
Objective: Enable the Digital Transformation

The data collected will provide valuable information for decision making with respect to grid modernization. The data will also be used as part of the digital transformation.

2.6 Program Risks

The main risks to delaying this work are for both people interacting with the system and employees along the system rights of way. The same condition which poses a safety threat may also be associated with the potential loss of reliability and resiliency. An increase in liability is always present when conductors or equipment are below the minimum clearance requirements of the codes and standards adopted by the utility.

Assessment of Transmission Lines

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$3.0**	**$3.0**	**$3.0**	**$20.8**
SRP Expenditures	$3.0	$3.0	$3.0	$3.0

3.2 Program Resource Requirements

Adequate resources to complete the work are likely a combination of internal and contractor resources.

Specialty assessments such as Xray and Lidar will be carried out by 3rd party contractors.

3.3 Estimating Methods & Assumptions

- Estimates based on average cost for pole and line assessments derived from previous experience
- LUMA anticipates using internal resources but will likely need to supplement with contract resources, which may increase average costs

Category	Percentage
Engineering & Admin	3%
Material	24%
Pre-construction Activities	26%
Construction & Commissioning	47%

3.4 SRP Program Timeline & Milestones



C.4 Substation Portfolio

LUMA plans to spend nearly $400 million over the next three years to rebuild, harden and modernize substations. Substations will be repaired, rebuilt and made safer, while increasing mitigation against future disasters. These programs will result in significant improvements to system resilience and safety. Table C-6 below presents a summary of the program spending for the largest programs in the substation portfolio, followed by a short description of each program.

Table C-6. Substation Portfolio Spending Estimates by Program ($ million, real)

	FY2023				FY2024	FY2025
Substation Programs	**Federal Funded Capital**	**Non-Federal Funded Capital**	**OpEx**	**Total Spend Estimate**	**Total Spending Estimate**	**Total Spending Estimate**
Substation Rebuilds	95	7	-	102	139	49
Substation Security	15	1	1	18	15	4
Substation Reliability	-	14	-	14	19	18
Regional & Technical Facilities Security	-	0	1	1	1	1
Grand Total	**111**	**22**	**2**	**135**	**173**	**71**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

Substation Rebuilds. This program focuses on improvements to transmission and distribution (T&D) substations to strengthen the electric grid. This includes (1) hardening and modernizing T&D substations, (2) making upgrades to the latest codes, industry standards and practices and (3) replacing electromechanical and electronic relays. To accomplish this, LUMA will conduct required assessment, repair, and rebuilding of damaged substations per the latest codes, industry standards and practices to improve long term reliability, install Gas Insulated Switchgear (GIS), replace electromechanical and electronic relays, and repair and / or rebuild substations impacted by flooding. This program will also focus on the demarcation requirements for Transmission and Generation (T&G) assets, required under the T&D OMA, specifically the Scope of Services as set forth in Annex I. The program must also include high accuracy metering[1] to accurately measure power generation into the network and facilitate communication with the system operator. This measurement will provide transparency of total net power generation and energy losses to the network. This demarcation will also be defined in a non-complicated manner to provide LUMA and GenCo operators sufficient clarity regarding the separation of assets to prevent mis-operation, and subsequent damage to equipment and / or system outages. This initiative is subject to change based on the recommendations from the Sargent and Lundy Demarcation Study and the plant retirement projections called for in the IRP.

Substation Security. This program will focus on a variety of security concerns at transmission and distribution substations. The program will replace and add new security technology and hardware to deter,

[1] High Accuracy Metering is defined as a total metering system, including meters, CTs, PTs with a recommended aggregate accuracy within one percent where possible.

detect and delay security incidents (e.g., intrusion, theft, damage, employee and public safety). Security concerns addressed by this program involve fencing and gates including locking devices, lighting, signage, perimeter cleanup and window bars. In distribution facilities, the program also addresses provision of locks for distribution switches and pad mount transformers in the field and meter locks at customer metering points.

Substation Reliability. This program will reinforce and upgrade the existing and aging system infrastructure to improve system reliability. This includes replacement of transformers, oil circuit breakers, distribution circuit breakers, other high voltage equipment, Alternating Current / Direct Current (AC/DC) systems, standby generators, relays, Remote Terminal Units (RTUs) and auxiliary systems, along with protection and control upgrades and procurement of emergency spares.

Regional and Technical Facilities Security. This program will replace and add new security technology and hardware to deter, detect and delay security incidents (e.g., intrusion, theft, damage) at regional and technical facilities. This includes replacing and installing new CCTV equipment at several regional and technical facilities. The program also funds fence repairs where identified.

Substation Rebuilds

1.0 Program Description

This program focuses on improvements to transmission and distribution (T&D) substations to strengthen the electric grid. This includes (1) hardening and modernizing T&D substations, (2) making upgrades to the latest codes, industry standards and practices and (3) replacing electromechanical and electronic relays.

To accomplish this, LUMA will conduct required assessment, repair, and rebuilding of damaged substations per the latest codes, industry standards and practices to improve long term reliability, install GIS, replace electromechanical and electronic relays, and repair and / or rebuild substations impacted by flooding.

This program will also focus on the demarcation requirements for T&G assets, required under the T&D OMA, specifically the Scope of Services as set forth in Annex I.

The program must also include high accuracy metering[1] to accurately measure power generation into the network and facilitate communication with the system operator. This measurement will provide transparency of total net power generation and energy losses to the network. This demarcation will also be defined in a non-complicated manner to provide LUMA and GenCo operators sufficient clarity regarding the separation of assets to prevent mis-operation, and subsequent damage to equipment and / or system outages.

This initiative is subject to change based on the recommendations from the Sargent and Lundy Demarcation Study and the plant retirement projections called for in the IRP.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA estimates that approximately 30 percent of the substations require safety and hazard mitigation to reach remediation. Field assessments will categorize assets according to their health, based on estimates of their condition (likelihood of failure) and criticality (consequence of failure) and assign an asset score from 0 (worst) to 4 (best). Mitigation of risk related to only the highest-risk assets will be categorized as a 0 or 1 and performed as SRP work. These deficient assets will exhibit the following:

- Extreme likelihood of failure, or already failed,
- *and* likely to cause:
  - A safety impact to the workers or the public,

[1] High Accuracy Metering is defined as a total metering system, including meters, CTs, PTs with a recommended aggregate accuracy within one percent where possible.

Substation Rebuilds

- Failure to meet applicable legal requirements or policies, including T&D OMA Annex I, Act 17-2019, as amended (Act 17), and Act 57-2014, as amended (Act 57), which include requirements related to safe and reliable utility operations, or
- An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

All deficient assets, including those in the SRP will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

Several substations were flooded during Hurricane Maria, which affected the components and equipment located in the switchyards and the control buildings. Damaged fences, missing grounding components, bent structures, leaking or out-of-service apparatus have been identified as common issues throughout the PREPA system.

Obsolete P&C and SCADA infrastructure do not allow better data collection schemes for asset condition assessments or remote supervision and control. Additionally, the rarity of spare parts for these systems complicates maintenance routines. As a result, emergency replacements with new and updated components are integrated into an archaic scheme that does not provide a real or final solution.

All substations require high level assessments to assess, prioritize, and plan the required remediation strategies. Most substations require major and minor repairs because of the 2018 hurricanes, approximately 30% of which are estimated to require safety and hazard mitigation to reach remediation. This includes repairs for the four broad based categories:

- Structure: Overhead hazards and unsecure equipment
- Yard: Unsafe yard conditions to equipment and personnel, caused by erosion of the substation pad, vegetation incursion reducing effectiveness of substation insulating gravel etc.
- Components: Imminent failure of high voltage equipment that can cause potential for employee or public harm
- Control House: Leaking roofs or equipment enclosures (including switchgear enclosures)

Further driving the need for this program, the T&D OMA Annex I, Section II(G), specifies that LUMA is responsible for the development of necessary interconnection agreements, identification of the interconnection demarcation points, and a work plan to delineate generator interconnection for new plants.

LUMA has made the following assessments regarding the current state of the interconnection points between the T&D System and PREPA's six major thermal generating plants (Costa Sur, San Juan, Palo Seco, Cambalache, Mayaguez, Aguirre) and the peaking / hydro plants:

- Demarcation supports compliance with SOP, contributing to system control and operation. The high accuracy metering, separation and operating agreement will need to specify proper separated interactions under normal and emergency conditions for LUMA to respond to events.
- A mis-operation without proper metering and communication with the system operator of the current protection scheme could place LUMA in a high-risk position should the following conditions apply:

- An outage at the demarcation point could potentially be widespread, affecting critical customers, for long durations. With no clear delineation of assets and responsibilities, response times will be extended, and responsibility for taking corrective actions will be unclear.
- Inaccurate metering (I.e., non-compliant) could result in unbalanced energy interactions, and incur corresponding financial, system operation and commercial risk as well as adversely affect the ability to accurately determine technical and non-technical losses. It could also result in inaccurate generation and energy injected information, with a cascading effect on system operations.

For the reasons stated above this program is included in the SRP.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

To ensure compliance with the relevant articles of Act 17 and Act 57, and the T&D OMA, high risk findings (Asset Score of 0 and 1) shall be incorporated into a remediation plan within 60 days of identification. That plan shall consider a coordinated approach to remediation based on severity and risk according to the objectives defined in LUMA's Recovery and Transformation Framework.

In the remediated state, the following will have been accomplished:

- Substation assessment for all substations,
- The key repairs, estimated at 30% of the substations, will be complete. This will eliminate critical failure points within the substation including identifying at risk in-service equipment, unsafe structures, or overhead hazards, leaking control buildings or switchgear enclosures, and unsafe yard conditions. All high-risk components in the substations will have been repaired or replaced to meet current codes and standards, the NESC, and requirements under Applicable Laws and the T&D OMA.

Flooded substations below the flood plain must also be remediated to comply with legal requirements, including the Puerto Rico Planning Board's Joint Regulation for the Evaluation and Issuance of Permits Related to Development, Land Use and Business Operations, Regulation 9233, effective January 2, 2020; Puerto Rico Planning Board's Special Flood Hazard Areas Regulation, Regulation 9238, effective January 7, 2021 (and preceding regulation currently in effect); Act 17-2019, as amended; and Act 57-2014, as amended.

PREPA's major generation plants, peakers, and hydro plants and the T&D System will be demarcated as identified in the interconnection and shared services agreements with each power plant as required under the T&D OMA Annex 1, Section II(G) and will also have high accuracy metering installed to measure the energy flowing into the T&D System.

Electrical interconnection operating agreements will exist between the power plant operator and LUMA for each unit within the power plant. New revenue class meters will be installed, replacing the existing non-revenue meters. The interconnection and operating agreements and the addition of high accuracy metering will reduce the risk of (but not eliminate) control errors that can lead to mis-operation.

Substation Rebuilds

Separate, yet shared site access to maintain transmission switchyard assets will exist at the major PREPA generation facilities hydro units and peaker units.

The demarcation and installation of high accuracy metering will be performed on all generation units. Currently, the program's estimated cost includes replacing the non-revenue meters with revenue meters and entering into interconnection and shared services agreements.

2.3 Description of Program Completed State

In the program completed state, the electric grid will have been heavily bolstered, including wide-scale repairs to substations, the enhancement of communication between substations and operation centers through new Intelligent Electronic Devices (IED) and an essential portion of the electric grid will be fully upgraded to all applicable codes, industry standards and practices. Specifically, this program completed state includes:

- Substation repairs throughout the electric grid
- Deployment of high voltage GIS systems
- Substation modernization for smart data collection by replacing electromechanical relays with microprocessor-based relays
- Replacing the non-revenue meters with revenue meters and entering into interconnection and shared services agreements

2.4 Program Activities

- Completion of High-Level Assessment, Near Term Reliability Plans, and Long Term Reliability and Asset Transformation Plan
- Completion of key substation repair items (imminent failure and major safety items) based on assessments over the different elements (primary equipment, security, safety and secondary equipment or control room)
- Major GIS deployments for critical substations
- Rebuild or relocate substations based on flood risk, condition, and criticality
- Ramp up to target of one transmission substation rebuild and two distribution substation rebuilds per year based on condition and criticality
- Major and minor substation repairs that are not SRP related based on detailed assessments over the different elements (primary equipment, security, safety and secondary equipment or control room)
- Substation upgrades: The upgrade work will include installing a new control building (if applicable), P&C and SCADA upgrades, new cabling, and some high voltage (HV) equipment replacements such as switchgear, breakers, disconnects, etc.
- Initiate discussions between LUMA and the operator of all PREPA generation units to identify the demarcation points and install revenue meters based on their size and retirement projections
- Prioritize installation of high accuracy metering where it makes sense in sequencing the work
- Define the high accuracy metering and demarcation projects and schedule based on priority, budget and operational impact
- Develop an operational agreement at all interconnection points to mitigate risk of mis-operation
- Train personnel and document training to avoid sole reliance on institutional knowledge (training requirements for LUMA and GenCo will be part of the operating agreement)
- Perform detailed engineering and construction means and methods to mitigate outage impacts

Substation Rebuilds

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

This program will improve safety standards for both employees and the public by increasing the distribution grid's ability to withstand severe weather conditions and will also bring substations up to applicable safety codes and standards.

Substation Rebuilds

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

This program will improve service reliability by increasing the electric grid's ability to operate under severe weather conditions. Additionally, the repairs and upgrades put in place will enable faster electric grid restoration under fail conditions.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

Provides employees with repaired infrastructure, thereby improving their ability to execute operations. The program will also provide for more data to support system operations, grid modelling, and asset conditions — all of which improve employee productivity and efficiency.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

This program will make use of federal funds to implementing an adequate and optimized solution, which will prevent catastrophic damages if a major weather event happens again.

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

Substation repairs directly restore and replace damaged grid infrastructure.

Improved resiliency by increasing the distribution grid's ability to withstand severe weather conditions.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

Enhancements to the existing power plant substations (GenCo assets) will have a positive impact on system integrity and will attract new generation siting as part of the renewable and energy storage plan forecasts in the approved IRP.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

Enhancement to the existing power plant substation will have a positive impact on system integrity by optimizing system control and operation which will enhance generation and transmission integration responding to events.

2.6 Program Risks

- Performing this work will take multiple years to complete. These substations, and as such the T&D grid, are at risk in the meantime
- Delaying some or all repairs and investments under this program will increase safety risks to employees and the public
- Lack of clear operating responsibility for assets not divided between LUMA and the GenCo

Substation Rebuilds

- Higher operational risk and potential damage of major equipment
- Higher risk of worker errors, leading to mis-operation
- Lower substation reliability and resiliency

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$102.2**	**$138.5**	**$48.9**	**$339.4**
SRP Expenditures	$96.7	$137.5	$47.9	$245.8

3.2 Program Resource Requirements

- External contract labor: The majority of projects will be conducted as EPC projects.
- Mobile substations to be used to minimize service interruption time during project execution
- Contract Labor — 40%
- Material Equipment — 60%

3.3 Estimating Methods & Assumptions

Preliminary Methods of Repairs (MORs) have been defined between PREPA and FEMA, such as substation relocation, drop-in control house, and GIS deployments. However, additional assessments will be performed to determine the final scope of work (SOW).

Regarding standards and requirements, all designs are expected to follow LUMA's engineering standards and the different Puerto Rico codes and regulations, such as the new Building Code for the drop-in control house design.

LUMA has provided estimates for the different projects assuming ±30% accuracy except FEMA funded projects.

Assumptions: Estimating splits based on historical projects:

Category	Percentage
Material	32%
Detailed Engineering	10%
Site preparation & Survey	17%
Construction	35%
Commissioning	5%

The interim program cost estimates for replacing the existing meters with high accuracy meters on all thermal, hydro and peaking units and enter into agreements:

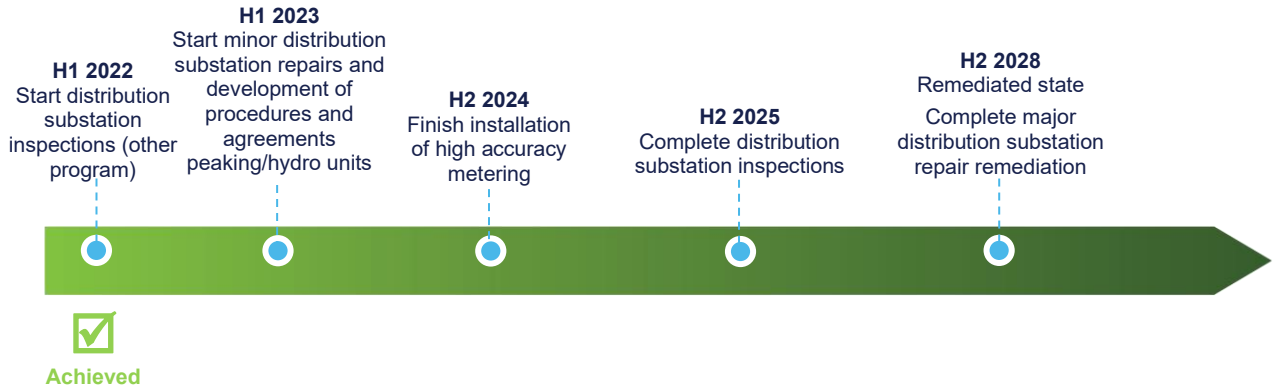
Substation Rebuilds

- Communication with the system operator is accomplished via cable connection from meter to master station, RTUs, etc.
- The new revenue meter fits in the same location as the existing non-revenue meter with minor modifications.
- Existing wiring is in good status. New wiring included in the estimate is for communication purposes.

The program cost estimates were based on the following factors and elements:

- Sage estimating software is used to determine material, labor, equipment, engineering, and project management as the direct charges. Indirect charges consisting of overheads, taxes, profit, etc., are estimated along with contingency based on maturity of the project.
- Sargent and Lundy (S&L) Report for Demarcation of PREPA Generation Assets from the Transmission and Distribution System, TD-0003, dated October 2019.
- Power plants' electrical single line diagrams were gathered covering all thermal, peaking and hydro generation units and utilized as a base for evaluating the feasibility of demarcation.
- Labor cost is based on US labor costs with increased overheads to account for contractor housing and overseas travel. Taxes were included. All costs are for year 2020.
- Project contingency is 30 percent based on maturity level or AACE® International Estimate Class 3 Cost estimate.
- In addition to maturity or project definition, estimate accuracy is also driven by estimator's experience and skill level, familiarity with the technology, and time and effort budgeted to prepare the estimate.
- There are no gaps for the intermediate program of installing revenue meters and entering into agreements.

3.4 SRP Program Timeline & Milestones



Substation Security

1.0 Program Description

This program will focus on a variety of security concerns at transmission and distribution substations. The program will replace and add new security technology and hardware to deter, detect and delay security incidents (e.g., intrusion, theft, damage, employee and public safety). Security concerns addressed by this program involve fencing and gates including locking devices, lighting, signage, perimeter cleanup and window bars. In distribution facilities, the program also addresses provision of locks for distribution switches and pad mount transformers in the field and meter locks at customer metering points.

2.0 Program Rationale

2.1 Current State & Identified Gaps

REDACTED

2.1.1 Additional Gaps Identified Post Commencement

REDACTED

Substation Security

2.2 Description of Remediated State

REDACTED

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

2.4.1 Additional Activities Identified Post Commencement

REDACTED

2.5 Program Benefits

REDACTED		

Substation Security

[redacted]	[redacted]	[redacted]
	[redacted]	
	[redacted]	[redacted]
[redacted]	[redacted]	
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	
	[redacted]	
	[redacted]	
[redacted]	[redacted]	

[redacted]

[redacted]

[redacted]

Substation Security

REDACTED

2.6 Program Risks

REDACTED

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$17.6**	**$15.0**	**$3.8**	**$7.5**
SRP Expenditures	$15.9	$14.0	$2.9	$3.2

3.2 Program Resource Requirements

- Internal planning and construction supervision.
- Tools and equipment for installation of locks.

Major work items will require construction contractors.

3.3 Estimating Methods & Assumptions

Estimates for the locks, lighting, signage, clean up, doors and windows, were prepared based on unit count multiplying by purchased cost and estimated time to install.

Estimates for the fences were based on an average estimated cost for average damage multiplied by the number of substations. For implementation of technology to monitor security, the estimates were produced from vendors' unit rates.

The estimates were based on broad understandings of the current state as no real data was available to the estimators. All estimates will be refined as more information becomes available on a site by site basis.

Substation Security

3.4 SRP Program Timeline & Milestones



Substation Reliability

1.0 Program Description

This program will reinforce and upgrade the existing and aging system infrastructure to improve system reliability. This includes replacement of transformers, oil circuit breakers, distribution circuit breakers, other high voltage equipment, Alternating Current / Direct Current (AC/DC) systems, standby generators, relays, RTUs and auxiliary systems, along with protection and control upgrades and procurement of emergency spares.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Upon review of PREPA's asset database and substation assessment, high voltage infrastructure was found in many cases to be aging, with a large quantity operating past expected useful life. Several substations still have transformers and circuit breakers in operation that were installed more than 40 years ago. Any of this equipment will be subject to more rigorous and frequent assessment and testing to maximize longevity. Replacement will be based on condition assessments including but not limited to, oil sampling on power transformers or breaker timing tests and contactor resistance checks for high voltage breakers.

With an aging infrastructure and major weather events such as hurricanes remaining a constant threat to the island, spare parts' stock is essential. However, because of limited resources, PREPA does not have those main components on hand in case of failures. The availability of mobile substations to be deployed in emergencies as a temporary measure will facilitate power restoration during outages caused by catastrophic equipment failures or poor project execution, but the long-term fix involves replacing these aged and deteriorating assets.

In some cases, transmission substations either lack an installed emergency generator or have one that is not in good working condition. Industry standards call for emergency generators to act as backup AC/DC power supply for all 230 kV substations. Currently, deficient AC/DC systems with cabling issues, broken panels and defective battery banks have been identified and need to be addressed.

The prevalence of obsolete protection and control (P&C) and Supervisory Control and Data Acquisition (SCADA) systems add to our maintenance costs, reduce the possibility of implementing asset monitoring to support the Asset Management process, and compromise our ability to supervise and operate the system remotely.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

Substation Reliability

2.3 Description of Program Completed State

At the end of the program, LUMA will have achieved the following:

- Restoration of substation design capacity to industry standards
- Rehabilitation, emergency replacements, and continual renewal of HV equipment in substations
- Modernized P&C and SCADA systems for data collection and use based on the latest industry standards

2.4 Program Activities

- Replace aging high voltage infrastructure such as transformers, circuit breakers and other high voltage equipment, including switches, potential transformers, arrestors, etc. that are deemed end of life and have poor condition assessment ratings
- Install standby generators as per new standard requirements and replace broken or deficient AC/DC systems
- Procure the required spare parts for high-voltage equipment based on industry standards to maintain adequate response levels for any eventuality or equipment failure

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☒ **Sustainable Energy**	☒ Modernizing the Grid	Direct

Substation Reliability

Primary Goals	Objectives	Direct or Indirect Impact
Transformation	☒ Enable the Digital Transformation	Direct
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

This program replaces equipment prone to failure and enhancing the protection system's ability to properly de-energize failed equipment, thus reducing safety risks for both employees and the public.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

This program improves reliability indices by proactively addressing potential points of failure.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Employees to Execute Operations Systematically

The program provides the means for quicker restoration of the system after equipment failure or damage by defining and acquiring the proper levels of spare parts.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure

- This program includes the replacement of failed transformers, circuit breakers and other high voltage equipment.

Objective: Improve Resilience of Vulnerable Infrastructure

Reduces the number of major forced outage impacts due to aged equipment.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid

Facilitates Asset Management activities by providing condition assessment data through modern P&C and SCADA infrastructure.

Objective: Enable the Digital Transformation

Enhances protection and the SCADA system, representing a step towards grid modernization.

Substation Reliability

2.6 Program Risks

- Risk of not pursuing this program: Since some of the primary or high voltage components (transformers, circuit breakers, etc.) are past their useful life, they run the risk of experiencing catastrophic failure. This is a major safety risk which could affect the entire electrical system if not replaced.
- Risk of program delays: Delaying this program could place service continuity at risk.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$14.1**	**$18.5**	**$18.0**	**$132.0**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

- Contract labor: The majority of projects will be Engineering, Procurement and Construction (EPC) with on-island and off-island resources.
- Replacement transformers, circuit breakers and other equipment.
- Mobile substations to be used for minimizing the service interruption time during project execution.

3.3 Estimating Methods & Assumptions

All designs will follow LUMA's engineering standards and the applicable Puerto Rico codes and regulations. Quantities and costs of affected high-voltage equipment are based on the reports of PREPA consultants and from condition assessments carried out by LUMA. Estimates for secondary equipment (such as AC/ DC systems and back-up generators) are based on similar estimates made for other projects. Quantities and costs of recommended spare parts are based on the experience of LUMA subject matter experts.

Assumptions: Mobile Transformers with suitable ratings are available. Estimating splits based on historical projects

Category	Percentage
Material	32%
Detailed Engineering	10%
Site preparation & Survey	17%
Construction	35%
Commissioning	5%

The percentages are based on typical substation project costs.

Regional & Technical Facilities Security

1.0 Program Description

This program will replace and add new security technology and hardware to deter, detect and delay security incidents (e.g., intrusion, theft, damage, etc.) at regional and technical facilities. This includes replacing and installing new CCTV equipment at several regional and technical facilities. The program also funds fence repairs where identified.

2.0 Program Rationale

2.1 Current State & Identified Gaps

REDACTED

2.1.1 Additional Gaps Identified Post-Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

2.4.1 Additional Activities Identified Post Commencement

REDACTED

Regional & Technical Facilities Security

2.5 Program Benefits

REDACTED		

2.6 Program Risks

REDACTED

Regional & Technical Facilities Security

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$0.8**	**$0.8**	**$0.7**	**$4.9**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

Program resources for outsourcing contractors and construction supervision.

3.3 Estimating Methods & Assumptions

These estimates were prepared based on discussions with local vendors, who provided unit rates. These estimates are approximations due to the lack of data available regarding the extent of the necessary repairs and replacements. The estimates will be adjusted once projects are identified and approved.

C.5 Control Center and Buildings Portfolio

Control centers are critical facilities that play a vital role in the safe, reliable and economic performance of the entire electric grid. It is imperative that control center operators have access to tools that provide situational awareness and a comprehensive and integrated visibility of the entire generation, transmission and distribution systems. This visibility allows the operators, by utilizing real time data, to minimize the impact to customers and the electrical system from outages and system instability that could cause a complete collapse of the system resulting in a black out scenario.

LUMA's near-term spending in the control center portfolio involves a number of improvements in policies, procedures and technologies that will enable LUMA to operate the system more reliably and efficiently. LUMA will also invest in rebuilding damaged facilities, upgrading security systems, and Advanced Distribution Management Systems that enable renewable energy, demand response and battery storage integration and dispatch. Table C-7 below presents a summary of the program spending for the largest programs in the control center and building portfolio, followed by a short description of the main programs in the portfolio.

Table C-7. Control Center and Buildings Portfolio Spending Estimates by Program ($ million, real)

	FY2023				FY2024	FY2025
Control Center and Buildings Programs	Federal Funded Capital	Non-Federal Funded Capital	OpEx	Total Spend Estimate	Total Spending Estimate	Total Spending Estimate
Critical Energy Management System Upgrades	25	0	-	26	20	6
Facilities Development & Implementation	10	2	2	15	25	44
Control Center Construction & Refurbishment	9	0	-	9	39	26
Warehouse Security	0	1	-	1	1	-
Critical Energy Management & Load Generation Balancing	-	0	0	0	7	13
Critical System Operation Strategy & Processes	-	-	0	0	-	-
Grand Total	**45**	**4**	**3**	**51**	**91**	**89**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

Critical Energy Management System Upgrades. This program will replace an obsolete and unsupported EMS and add relevant technology to operate the electric system safely and reliably. This program will also implement an Advanced Distribution Management System (ADMS). The EMS is a computer-based system that is used by operators to monitor, control and optimize the performance on the generation, transmission and distribution system.

Annual Budgets

Facilities Development & Implementation. This program is focused on the development, implementation, and maintenance of several different areas overseen by the Real Estate, Facility Services and Architectural divisions, including:

- Construction required to remediate facilities and real property (e.g., warehouses, mechanic shops, etc.) damaged by natural disasters
- Implementation of a facility capital improvement program
- Implementation of LUMA testing lab facilities
- Implementation of an asset management system to support facility maintenance and the preventative maintenance program
- Deployment of robust security devices and systems
- Development and implementation of a tenant services program
- Development and implementation of safety training programs for Facilities employees
- Planning and construction to delineate space between LUMA and GenCo

Control Center Construction & Refurbishment. This program is targeted at construction or refurbishment of buildings to house the main and back-up control centers and all ancillary support services. Since the current control centers have fallen into disrepair, this program will rebuild or relocate them, along with establishing a designated backup control center. At the same time, the program will centralize more control center activities.

Warehouse Security. This program will focus on providing CCTV, card access and fencing at various warehouse locations. This program will replace and add new security technology and hardware to deter, detect and delay security incidents (e.g., intrusion, theft, damage) at warehouses.

Critical Energy Management & Load Generation Balancing. This program will develop capabilities related to energy management and load / generation balancing. This includes development of strategies and mechanisms for energy balancing and the establishment and implementation of a strategy for operating reserves. Additionally, the program will address technology needs to efficiently manage renewable energy, battery storage and demand response programs, along with defining the role of microgrids within the electrical system as required by the IRP.

Critical System Operation Strategy and Processes. This program will develop all the procedures and strategies necessary to operate the electrical system reliably and efficiently. This includes procedures and strategies associated with managing blackstart, load shedding, outage management, transmission lines, substations, distribution, and the training on the new version of the Outage Management System. Procedures developed will be consistent with the System Operation Principles including the implementation of Estimated Times of Restoration for customers.

Critical Energy Management System Upgrades

1.0 Program Description

This program will replace an obsolete and unsupported EMS and add relevant technology to operate the electric system safely and reliably. This program will also implement an ADMS. The EMS is a computer-based system that is used by operators to monitor, control and optimize the performance of the generation, transmission and distribution system.

2.0 Program Rationale

2.1 State & Identified Gaps

REDACTED

2.1.1 Additional Gaps Identified Post-Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

Critical Energy Management System Upgrades

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

REDACTED

2.4.1 Additional Activities Identified Post-Commencement

REDACTED

2.5 No additional activities identified at this time Program Benefits

REDACTED		

Critical Energy Management System Upgrades

[redacted]

2.6 Program Risks

[redacted]

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$25.7**	**$19.5**	**$6.1**	**$5.1**
SRP Expenditures	$25.6	$15.5	—	—

Critical Energy Management System Upgrades

3.2 Program Resource Requirements

LUMA hired a project team and a consultant to support the implementation of this program. LUMA will bring on new people to be trained to use the modernized system and be the support team for the next decade (this project will be managed in collaboration with our IT/OT group).

3.3 Estimating Methods & Assumptions

Originally LUMA obtained a high-level estimate from IBM for replacement of the existing EMS. As the project is moving forward, the project team provided a more detailed estimate.

The cost estimates will be adjusted as more detailed information becomes available.

3.4 SRP Program Timeline & Milestones



Facilities Development & Implementation

1.0 Program Description

This program is focused on the development, implementation, and maintenance of several different areas overseen by the Real Estate, Facility Services and Architectural divisions, including:

- Construction required to remediate facilities and real property (e.g., warehouses, mechanic shops, etc.) damaged by natural disasters
- Implementation of a facility capital improvement program
- Implementation of LUMA testing lab facilities
- Implementation of an asset management system to support facility maintenance and the preventative maintenance program
- Deployment of robust security devices and systems
- Development and implementation of a tenant services program
- Development and implementation of safety training programs for Facilities employees
- Planning and construction to delineate space between LUMA and GenCo.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

PREPA's current commercial real estate portfolio consists of:

- 23 warehouses that support T&D operations and customer service
- Four plant warehouses
- 24 mechanic shops
- One helicopter hanger
- One control center
- One backup control center
- 45 technical offices
- 39 commercial offices
- 31 former offices that have been closed
- Five corporate offices
- 23 properties where PREPA is the landlord

The Facility Services and Real Estate department is comprised of four divisions that are siloed. There are no established workflows or practices documented showing inter-departmental collaboration. Facilities management is decentralized across Puerto Rico. 16 out of 197 properties are maintained by the PREPA Facilities team. The remaining 181 facilities are managed independently. LUMA plans to implement a centralized facilities management model to maximize economies of scale.

Significant gaps were identified within the Real Estate, Facilities Services and Architectural divisions during the gap assessment:

- PREPA lacks the experience, programs, processes, training, tools, equipment, assets and infrastructure to adequately, efficiently and safely operate and maintain building assets
- Existing facilities, fences, security infrastructure and yards are significantly damaged from the hurricanes, lack regular maintenance or capital replacement programs and present employees with unsafe or uninhabitable conditions
- PREPA is not currently compliant regarding OSHA regulations, the International Fire Code, fire services features, fire protection and life safety systems and building services and systems
- Certain facilities or properties may be in a hazardous or an environmentally unsafe condition and/or contain hazardous and unsafe materials or products
- Baseline data to measure key performance indicators, internal benchmarking, service requests and closeout rates are unavailable. There are no observed measurements of performance in any area of Real Estate or Facility Services

2.1.1 Additional Gaps Identified Post-Commencement

Develop and implement inventory and asset tracking, auditing, and decommissioning processes.

Develop and implement business continuity plans for post-emergency event preparedness per facility.

2.2 Description of Remediated State

In the remediated state, the following will have been achieved:

- Construction on sites with damage caused by hurricanes, flooding and earthquakes will have been completed with certificates of inspections and occupancy that meet building code and municipality regulations
- Upgrades to life, fire, safety, security systems and physical barriers and equipment will have been locked or tagged out, inspected and repaired, providing certificates of approval that meet building code and municipality regulations
- Site abatement and remediation or legal containment for hazardous materials will have been carried out
- The organization will have become compliant with all local, commonwealth, federal laws and regulations and training requirements and certifications

2.3 Description of Program Completed State

The following are aspects of the program completed state:

- The department will be lean, agile, accurate, redundant and able to meet the forthcoming changes required to meet Act 17 renewable energy targets
- Safety will be embedded in the organization’s operating procedures and all equipment will support/enhance a safe working environment
- Facilities will meet all building code requirements, will be able to adequately support the needs of the organization and be prepared against natural disasters
- The department will be centralized, working collaboratively with internal stakeholders
- Decisions will be data driven and evidence based, relying on established benchmarks, key performance indicators and industry standards

- The service requirements of the organization will be exceeded in steady state or emergency operations while remaining fully compliant with all local, commonwealth and federal laws and regulations
- Assets damaged due to hurricanes such as furniture, building systems, parts and components will have been decommissioned or retired

2.4 Program Activities

- Development of Real Estate and Facility Services bid, build, design processes, templates and standards. These will be controlled by governing boards comprised of select parties within the organization
- Conducting health checks and sustainability inspections per commercial site
- Carrying out asset compilation of building systems and components, studies of remaining useful life and required capital improvements per commercial site
- Procurement of services and materials to perform repairs/improvements to remediate and reconstruct facilities. Deficiencies include repairs to roofs, walls, drainage, overhead cranes, fences, yards, water distribution systems, internal and external lighting, generators, Heating, Ventilation and Air Conditioning (HVAC), doors, windows and shutters
- Remediation or legally compliant containment of any hazardous materials found on the properties or within the facilities
- Installation and activation of CCTVs, intrusion detection systems, centralized and company-wide card access systems
- Development of preventative maintenance, training and educational programs to ensure safe work practices are employed across the organization
- Instituting programs and services that promote healthy and safe working conditions for personnel within the facilities across the organization

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Indirect

Facilities Development & Implementation

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☒ Enable the Sustainable Energy Transformation	Indirect
☒ **Other**	☒ Other: Environmental	Indirect

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Real Estate and Facility Services employees will have the expertise, training, equipment and knowledge to perform safe work within the facilities.

Any identified hazardous materials will have been remediated or otherwise legally contained and safeguarded.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability
Objective: Deliver Electricity at Reasonable Prices

This program will enable the organization to focus on its core functions delivering service to the customer with greater reliability, at a lower cost, with greater efficiency and a lower safety risk.

Procuring materials and services through an economies of scale model, removing costs from supply chain processes and reducing material unit prices will reduce overall service costs.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

Implementation of defined procedures, processes and performance measurement as well as technology implementation will improve efficiency and allow for data driven decisions. This will also allow employees to execute operations more efficiently.

Objective: Pursue Project Delivery Excellence

Increased facility repairs and maintenance through a centralized team to improve execution of capital projects and reduce risk.

Facilities Development & Implementation

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Enable the execution of critical projects that replace and restore critical infrastructure within yards and facilities, thus allowing for more effective deployment of federal funds.

Objective: Improve Resilience of Vulnerable Infrastructure

This program allows for more efficient replacement and repair of facility systems and their components to prepare for and withstand natural disasters.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Enable the Sustainable Energy Transformation

These programs help to reduce energy consumption rates within facilities by introducing energy efficiency programs and sustainability initiatives. As such, these programs ensure system infrastructure is rebuilt to accommodate a higher penetration of intermittent distributed resources.

PRIMARY GOAL: OTHER

Objective: Other: Environmental

These programs reduce liability and risk by completing HAZMAT programs and implementing policies and procedures related to acquisition, construction, refurbishment, decommissioning or remediation of real estate and real property.

2.6 Program Risks

RISKS OF DELAYING THE PROGRAM

- Non-compliance with International Building Code
- Loss of life or asset(s) or personal injury due to failed or unavailable life, fire, safety systems or failure to legally contain or remove hazardous substances
- Loss of life or personal injury due to untrained employees or unsafe work practices
- Risk to meeting fiscal control metrics and internal audits: No visibility of spend, unexecuted lease contracts, run to fail buildings approach
- Increase in employees lost time for unhealthy working conditions
- Insurance and liability risks for faulty building systems and components
- Capital investment could be exponential should another natural disaster occur prior to remediation

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$14.8**	**$24.6**	**$43.9**	**$170.3**
SRP Expenditures	$13.1	$23.6	$40.3	$159.9

Facilities Development & Implementation

3.2 Program Resource Requirements

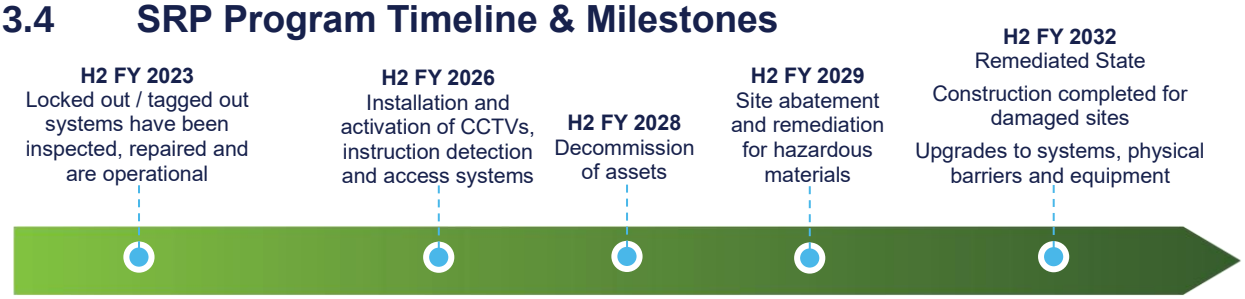
Each project within the program will have its own resource requirements to be identified as part of a project plan. In general, the program will require resources to be hired internally as well as external contractors to complete work required.

3.3 Estimating Methods & Assumptions

Estimating Method/Assumption: (Estimate template available if required)

- Researched materials and equipment costs
- Researched construction costs per square foot for green field, brown field, commercial, residential property types
- Researched vendor labor rates
- Used industry and market average rates for utility consumption estimates
- Assumed loaded hourly rates for full-time employees for employee training
- Used comparable historical proforma costs for facility maintenance and tenant services
- Used comparable historical costs for capital improvement programs

3.4 SRP Program Timeline & Milestones



Control Center Construction & Refurbishment

1.0 Program Description

This program is targeted at construction or refurbishment of buildings to house the main and back-up control centers and all ancillary support services. Since the current control centers have fallen into disrepair, this program will rebuild or relocate them, along with establishing a designated backup control center. At the same time, the program will centralize more control center activities.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

REDACTED

2.1.1 Additional Gaps Identified Post-Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

2.4.1 Additional Activities Identified Post-Commencement

REDACTED

2.5 Program Benefits

REDACTED		

Control Center Construction & Refurbishment

REDACTED		

2.6 Program Risks

REDACTED

Control Center Construction & Refurbishment

REDACTED

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$9.4**	**$39.4**	**$25.8**	**$7.9**
SRP Expenditures	$6.2	$25.7	$16.8	—

3.2 Program Resource Requirements

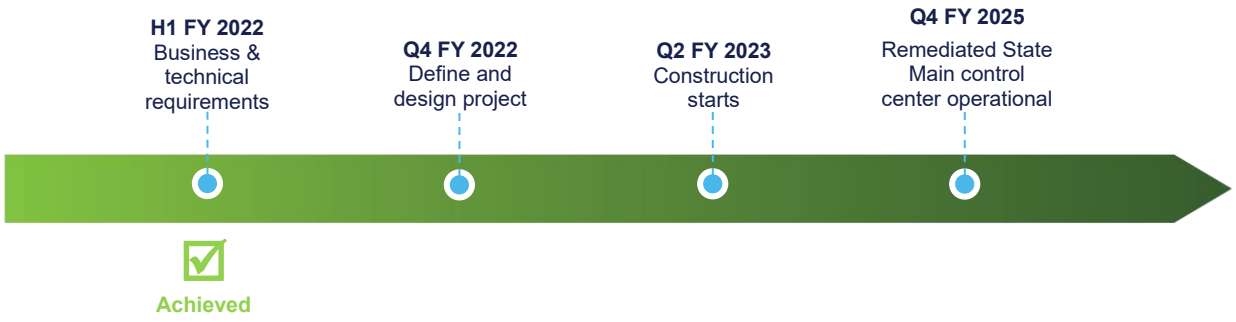
LUMA will need a project team and varied expertise throughout the project.

3.3 Estimating Methods & Assumptions

Initially the estimation was performed by LUMA's real estate group based on cost per square foot and general requirements. LUMA also obtained an order of magnitude estimate from a consultant that substantially agreed with internal estimates. As the project progressed, the project team updated the cost estimates.

This estimate is based on the construction of two new facilities (main control center and back up control center). LUMA is also looking at options to utilize existing buildings that will need renovation or remodeling, and/or renting existing buildings. These options could be less costly and will be part of the initial program assessment.

3.4 SRP Program Timeline & Milestones



Warehouse Security

1.0 Program Description

This program (Warehouse Security) will focus on providing CCTV, card access and fencing at various warehouse locations. This program will replace and add new security technology and hardware to deter, detect and delay security incidents (e.g., intrusion, theft, damage, etc.) at warehouses.

2.0 Program Rationale

2.1 Current State & Identified Gaps

REDACTED

2.1.1 Additional Gaps Identified Post-Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

REDACTED

2.4.1 Additional Activities Identified Post-Commencement

REDACTED

Warehouse Security

2.5 Program Benefits

REDACTED		

Warehouse Security

2.6 Program Risks

REDACTED

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$0.9**	**$0.6**	**—**	**—**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

The work will be carried out by contractors.

3.3 Estimating Methods & Assumptions

This program costs were estimated based on a combination of vendor unit rates and experience. These estimates will be refined once the projects are approved and the scope better defined.

Critical Energy Management & Load Generation Balancing

1.0 Program Description

This program will develop capabilities related to energy management and load / generation balancing. This includes development of strategies and mechanisms for energy balancing and the establishment and implementation of a strategy for operating reserves. Additionally, the program will address technology needs to efficiently manage renewable energy, battery storage and demand response programs, along with defining the role of microgrids within the electrical system as required by the IRP.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

REDACTED

2.1.0 Additional Gaps Identified Post-Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

2.3 Description of Program Completed State

REDACTED

2.4 Program Activities

2.4.0 Additional Activities Identified Post-Commencement

REDACTED

Critical Energy Management & Load Generation Balancing

2.5 Program Benefits

REDACTED		

Critical Energy Management & Load Generation Balancing

REDACTED

2.6 Program Risks

REDACTED

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.4**	**$7.0**	**$13.0**	—
SRP Expenditures	$0.1	—	—	—

3.2 Program Resource Requirements

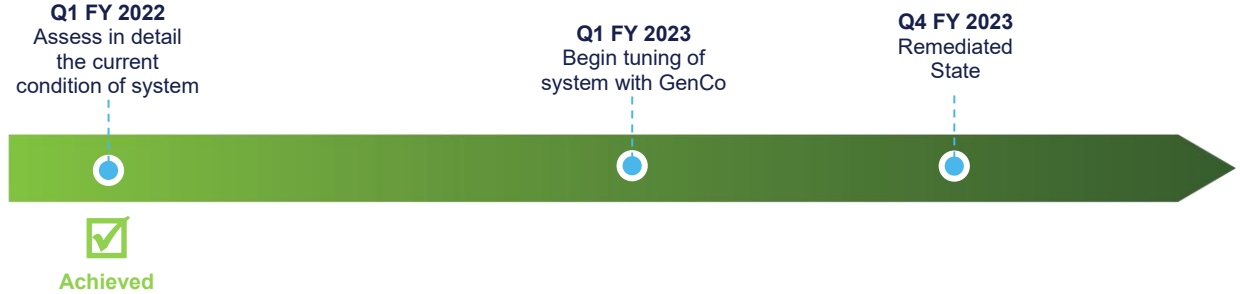
Resources to complete this program will be LUMA engineers, consultants and vendors.

3.3 Estimating Methods & Assumptions

The program costs were estimated on a rates per hour basis. Hours were estimated based on experience of LUMA subject matter experts associated with the program.

For the new technology, costs are estimated as an order of magnitude based on SME experience and discussions with industry experts. These estimates will need to be refined once the scope is more precisely defined.

3.4 SRP Program Timeline & Milestones



Critical System Operation Strategy & Processes

1.0 Program Description

This program will develop all the procedures and strategies necessary to operate the electrical system reliably and efficiently. This includes procedures and strategies associated with managing blackstart, load shedding, outage management, transmission lines, substations, distribution, and the training on the new version of the Outage Management System. Procedures developed will be consistent with the System Operation Principles including the implementation of Estimated Times of Restoration for customers.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Currently PREPA does not have any documented procedures to operate the electric system. Although PREPA does not fall under the jurisdiction of North American Electric Reliability Corporation (NERC), this is a minimum requirement of any utility operation as indicated in the NERC requirements and guidelines (references for industry standards). Currently, operations processes and other knowledge are transmitted informally by experienced employees to others. This method often results in an apparent erosion of institutional knowledge, and expertise is highly individualized. To ensure meeting minimum requirements to operate the system, LUMA will develop a full set of documented procedures that are industry practice for system operations.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps identified at this time.

2.2 Description of Remediated State

Some procedures are more critical than others and this program will prioritize them accordingly. These procedures are the blackstart, outage management and load shedding. They are required under the System Operation Principles and necessary to ensure the reliability of the system, and safety of employees and the public, therefore they are included in the SRP.

This program will follow the principles set forth in the T&D OMA, Act 17, and Act 57, and will be remediated once the blackstart, outage management and load shedding processes have been developed, tested, and adjusted and employees have been formally trained in these processes.

2.3 Description of Program Completed State

In the program completed state, LUMA will have a documented and regimented complete set of procedures to operate the electric system. Employees will be formally trained in these procedures, eliminating key main risk caused by dependence on experienced employees passing knowledge on informally.

Critical System Operation Strategy & Processes

2.4 Program Activities

- List all required operating procedures, working with experienced employees and using third party expertise where necessary. LUMA's System Operation Principles will be the overarching principles upon which these procedures will be based.
- Prioritize development based on procedures' importance.
- Develop the procedures working with current operators and engineers and third-party expertise as necessary.
- Develop plan to enhance outage management plan that connects to customer service interface in real time.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Indirect
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

FY 2023

Critical System Operation Strategy & Processes

Having appropriate procedures and enforcing them can have a major positive impact on the safety of field workers. A set of rules that is understood and followed by all will help to ensure employee safety.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

Having procedures and following them in a difficult situation can help to avoid mistakes leading to service interruptions. Service reliability will benefit from this.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

Having procedures in place, in accordance with Annex I, Section 1(A)(8) and Section 1(B)(6) of the T&D OMA, will ensure standardization of how operations are carried out throughout the system and will provide individual operators with the right tools to make the right decisions when in doubt.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

In the event of an approaching weather disturbance, having procedures in place will allow the operators to perform actions (re-route power, adjust dispatch configuration, take elements out of service, etc.) ahead of time and configure the system in a way that will minimize the impact of the storms, increasing system resiliency.

2.6 Program Risks

- The ongoing erosion of knowledge will eventually lead to an inability to operate the system safely and reliably.
- Not having procedures does not provide a benchmark or a reference to measure or assess performance of people and assets. This makes it difficult to develop a culture of improvement. It also leads to making incorrect decisions or improvising with potentially bad results.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.2**	—	—	—
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

- LUMA operators and engineers
- Third-party consultants

Critical System Operation Strategy & Processes

3.3 Estimating Methods & Assumptions

Project costs were estimated on a rate per hour basis. Hours were estimated based on the experience of the SMEs.

3.4 SRP Program Timeline & Milestones



C.6 Enabling Portfolio

The Enabling portfolio is composed of safety and operational excellence programs that provide a safe workplace through new procedures, tools, training. Investment programs include the provision of new tools and PPE (as well as provisions for their inventory and management), training in skills and safety for all employees, a new program management office specifically designed to handle large capital projects, and new data systems to accurately store and manage data on T&D assets gathered through assessments. LUMA will implement new project and business management procedures and controls to ensure transparent, systematic management of the business, and to effectively administer federal grant funding. Table C-8 below presents a summary of the program spending for the largest programs in the enabling portfolio, followed by a short description each program.

Table C-8. Enabling Portfolio Spending Estimates by Program ($ million, real)

Enabling Programs	Federal Funded Capital	Non-Federal Funded Capital	OpEx	Total Spend Estimate	Total Spending Estimate	Total Spending Estimate
Vegetation Management	-	-	50	50	60	60
Compliance, Studies, Technology & Performance	16	2	-	18	9	8
HSEQ and Technical Training	-	-	15	15	8	5
T&D Fleet	2	8	2	12	29	25
Tools Repair & Management	-	6	-	6	7	5
Asset Data Integrity	-	5	0	5	3	3
Permits Processes & Management	-	-	2	2	2	-
Workflow Processes & Tracking	-	-	1	1	1	10
Materials Management	0	0	0	1	5	5
Project Management Software & Tools	1	-	-	1	-	-
Construction & Commissioning Management Office	1	-	-	1	-	-
Operator Training	-	-	0	0	-	-
Emergency Response Preparedness	-	0	-	0	2	0
Project Controls, Risk Management & Estimating Offices	0	-	-	0	-	-
Capital Programs, PMO & Funding Management Office Setup	0	-	-	0	-	-
Grand Total	**20**	**22**	**71**	**113**	**124**	**122**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

Annual Budgets

Vegetation Management. This program includes work to abate or mitigate immediate vegetation risk in the most critical locations, along with an ongoing program to clear and re-establish rights-of-way (ROWs) to standard widths. This includes an immediate response for the highest risk sites (those that pose hazards to public safety or routinely experience tree-caused service interruptions), along with reclaiming rights-of-way corridors (especially those impacting the transmission and distribution systems). The program will also use a field enabled IT tool to manage the vegetation management program, along with ongoing line clearance, pruning, tree removal, herbicides, etc. and vegetation management training. In addition, the program will evaluate and pilot an advanced artificial intelligence (AI) remote sensing project to improve vegetation management.

Compliance & Studies, Technology & Performance. There are three components of this program – compliance and studies, technology and performance. The compliance and studies can be broken out into three sections: (1) distribution studies focused on eliminating major cascading outages and implementing new procedures and standards to ensure the distribution system complies with regulations and Prudent Utility Practice; (2) studies, procedures and standards for Substations and Transmission compliance; (3) transmission and distribution compliance projects. The technology portion will support distribution planning and protection studies, produce hosting capacity information and procure power quality monitoring equipment and meters as well as transmission technology that will improve the mechanisms to collect digital data and enable access to critical assets. The performance portion includes the development of processes and tools to measure and report KPIs and other performance metrics.

HSEQ & Technical Training. This program provides health, safety, environment and quality (HSEQ) and technical training to field personnel. During the initial stage, basic technical training will be provided through the LUMA College and HSEQ training conducted by internal subject matter experts and external providers. Personnel will gain technical skills training for field employees to become fully qualified to complete their work safely and efficiently. Subsequent enhanced technical training will be provided through the LUMA College. Enhanced training modules will be developed and administered based on operational needs for the type of technology being implemented but could include areas such as operation of smart grids, work on energized lines (e.g., hot line and barehand programs), splicing of conductors and helicopter work for transmission repairs. This program will help to instill a new safety culture across the T&D System, thus reducing safety incidents, bringing the T&D System into compliance with Contract Standards, including but not limited to OSHA and broader industry standards and improving overall employee efficiency.

T&D Fleet. The T&D Fleet program includes a range of activities and investments to bring the current fleet up to industry standards including vehicles, and equipment. Additionally, activities will be focused on initializing and improving processes for data collection, repair and maintenance of these assets.

Tools Repair & Management. This program focuses on a PPE and tooling plan to address safety needs along with putting in place a better system for managing PPE and tools. In addition to acquiring the needed PPE and tools, this program includes implementation of a centralized Tool and Equipment Crib system to improve inventory management, tool maintenance, tool supply and coordination and oversight of tool and equipment use.

Asset Data Integrity. This program is targeted at assuring the integrity of key asset data, with a focus on GIS and CMMS. The program works with stakeholders to identify data requirements, determine process and templates for storing data and update asset data systems with data gathered from asset

assessments. These systems and the integrity of their information are fundamental for accurate modeling, operations and planning of the T&D System.

Permits Processes & Management. LUMA will introduce new systems for managing operational permits to enable the system to comply with permit obligations and to provide support for federal funding requirements. The program will develop new procedures so that responsible parties have the tools to meet permit obligations, and identify additional necessary permits, along with introducing training programs to allow those procedures to be implemented effectively. As part of this program, LUMA will continue to engage with government agencies to adhere to any adjusting permitting procedures or requirements to be implemented.

Workflow Processes & Tracking. This program includes several initiatives that address gaps between current state and standard industry methods, practices, and processes to manage, track, and report progress on the performance of field work. Specific areas include:

- Establishing proper and safe maintenance regimens (preventive, planned and unplanned corrective, and emergency repairs)
- Adhering to design, maintenance and construction standards
- Implementing proper assessment and testing procedures
- Implementing KPI / metric performance management with a focus on measuring and driving improvements in work quality, effectiveness and efficiency
- Implementing technologies to reduce cycle time in identifying and remediating any performance anomalies while concurrently supporting the AM function.

Materials Management. This program covers all aspects of materials management and includes management of:

- Asset recovery
- Oil containment
- Inventory management
- Asset suite reconfiguration
- Demand training
- Implementation and measurement of KPIs related to materials
- Capital plans for material handling and warehousing storage and facility improvements
- Logistics function and related equipment
- Material evaluation and disposition

Project Management Software and Tools. LUMA will introduce new specialized project management, schedule management and project analysis software to ensure efficient execution of capital projects. This includes setup of an IT-based project, program and schedule management tool, a cost management and project analysis/reporting tool, a tool for workforce planning, scheduling, resource leveling and resource management, and a tool to develop, manage and control PMO processes and flowcharts.

Construction & Commissioning Management Office. This program entails the setup of the Construction and Commissioning Management Office (CCMO) under LUMA's Capital Programs department. This office will be responsible for planning, managing, and controlling all construction and commissioning work using either LUMA internal resources or using external construction and

commissioning contractors. The office will also be responsible for ensuring that all construction and commissioning work is completed on budget and on time as per the agreed scope.

Operator Training. This program will provide all necessary requirements to support new and existing system operator training along with operator competency assessments. As such, the program will address the need to improve current operator training and allow for new cohort(s) of operators to support the system. This will also improve operator response during an emergency situation.

Emergency Response Preparedness. This program is focused on emergency response management. The program implements the ERP and establishes the OEMBC. Also included are establishment of a primary and alternate LUMA EOC, along with development and elaboration of plans, processes, and procedures to be enacted in the event of an emergency.

Project Controls, Risk Management & Estimating Offices. This program entails the creation of the Project Controls, Risk Management and Estimating offices within the Capital Programs department. The Project Controls office will be responsible for project scheduling, cost control and scope management, along with ensuring that projects operate on budget, on time and as per defined scope. The Risk Management office will be responsible for identifying project risks, analyzing risk probability, impact and ranking, planning risk mitigation and calculating required contingency levels for mitigating unavoidable risks. The Estimating office will be responsible for preparing project estimates, cost baselines, etc. for all capital program T&D projects. Each of these offices will be stood up and staffed under this program; however, contractor resources will supplement LUMA employees as needs for capital programs arise but will be managed and supervised through the appropriate offices under the department.

Capital Programs, PMO & Funding Management Office Setup. LUMA is creating a dedicated Capital Programs department to manage the large number of capital improvement projects to be undertaken. The Capital Programs department will include T&D Project Management offices, a PMO and an Innovative Energy Management (IEM) office to manage FEMA and other federal funding. This will replace the current PREPA PMO and also include specific project management capabilities. The Capital Programs department will be responsible for executing and managing T&D projects. This execution will be handled through in-house resources, an EPC (Engineering, Procurement and Construction) method or any combination of Engineering (E only) contractors and/or Procurement and Construction (PC) contractors. The Capital Programs department will fully manage and monitor the work of any contractors on T&D capital projects, including but not limited to those hired to engineer, procure, and construct T&D infrastructure.

These will include measures to be put in place before, during and after a disaster. Additionally, the program supports acquisition of damage assessment software and accreditation from the EMAP.

Vegetation Management

1.0 Program Description

This program includes work to abate or mitigate immediate vegetation risk in the most critical locations, along with an ongoing program to clear and re-establish Scope of Work (ROWs) to standard widths. This includes an immediate response for the highest risk sites (those that pose hazards to public safety or routinely experience tree-caused service interruptions), along with reclaiming rights of way corridors (especially those impacting the transmission and distribution systems). The program will also use a field enabled IT tool to manage the vegetation management program, along with ongoing line clearance, pruning, tree removal, herbicides, etc. and vegetation management training. In addition, the program will evaluate and pilot an advanced AI remote sensing project to improve vegetation management.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

There is no centralized team with the responsibility and authority for maintaining vegetation and managing vegetation-related processes in the existing T&D System, and thus there is no regular vegetation management program in place. In-house employees and contractors do not operate using the most up-to-date utility vegetation management industry standards and best management practices.

Vegetation maintenance has largely been deferred, with the vegetation maintenance work being performed by in-house personnel conducting predominantly reactive or corrective maintenance (a.k.a., “hot spotting”). Some preventive vegetation maintenance work is being performed by contractors working under PREPA’s PMO.

Current pruning practices are not very effective, mostly resulting in excessive regrowth and wounding of trees, which increase the likelihood of structural failure.

Many personnel rely on the use of machetes and do not have access to more useful tools. The equipment that is used by in-house personnel is in poor repair, without the use of specialized vegetation management equipment. There is little use of herbicides and no use of tree growth regulators. The lack of appropriate tools and equipment contributes to low productivity of in-house personnel.

Insufficient tree clearance and lack of vegetation maintenance in general is a significant contributor to system unreliability, especially in extreme weather events such as hurricanes. This also creates a public safety hazard- directly in the form of fallen wires or children climbing trees too close to energized lines and indirectly in the form of power outages.

These findings indicate possible failure to meet applicable legal requirements, policies or standards or the OMA requirements including Prudent Utility Practice. Specifically, these are:

- Act 57-2014, providing that PREB will oversee the compliance of the T&D operator with a vegetation plan in accordance with industry best practices.

- Act 17-2019, which establishes priorities for the maintenance of infrastructure of the electric system and create vegetation management plans).
- The OMA which requires LUMA to implement a vegetation management plan in accordance with Prudent Utility Practice and applicable laws.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, the following will apply:

- A centralized vegetation management team will have been created and staffed by professionals who will establish procedures and practices aimed at eliminating public endangerment and promoting a safe and efficient work environment.
- The reestablishing of maintainable tree-conductor clearances on the T&D System, including:
  - Initially, reactive maintenance response that will target specific locations that pose the greatest risk to public safety, reliability, and system capacity (i.e., address the “worst of the worst”)
  - Reclamation of the ROWs that are currently overgrown and out of control and pose a risk to public safety, service reliability and system capacity. This will include being in compliance with Act 17-2019. In the remediated state, LUMA will set a baseline from which LUMA will establish reasonably maintainable conditions.
- Establishment of steady state ongoing preventive vegetation maintenance practices (versus reactive response practices), as individual circuits are reclaimed (consistent with the principles of integrated vegetation management).
- Being in compliance with Section 1.15 of Act 17-2019.

2.3 Description of Program Completed State

Vegetation related functions will be centrally managed by a dedicated vegetation management (VM) team composed of utility vegetation management industry subject matter experts (SMEs) with the responsibility and authority to complete the work in a timely and effective manner. The program will be guided by the Vegetation Management Plan (VMP) based on current industry standards and in compliance with the requirements of Act 57-2014, Act 17-2019, and the OMA.

The VMP will be based on the principles of integrated vegetation management, which is an approach for sustainable management of vegetation over the long term rather than simply controlling vegetation currently in conflict with overhead lines.

Technical specifications will establish vegetation maintenance work expectations, and process flows will be used to define standard approaches to manage the necessary types of maintenance work more efficiently. Performance measurement and quality systems will be used in managing vegetation maintenance work. A range of specialized vegetation maintenance services will be used to complete the work.

2.4 Program Activities

The program includes two major elements. This first involves reclamation of the existing ROWs, planned to occur over approximately the first three years. As individual circuits are reclaimed, they will transition to

long term preventive maintenance. The second element is a program of rapid reactive response to address the most critical locations.

A field enabled IT tool will be implemented and used to manage vegetation maintenance work, including planning, scheduling, executing, and evaluating the effectiveness of vegetation maintenance activities. The data collected using this tool will be used to support defining resource requirements and budgets, based on quantitative estimates of the vegetation maintenance workload to be completed. Performance measurement and quality-control systems will be established and used to manage vegetation maintenance work.

The VM team will be staffed with SMEs who will act as mentors, assisting in developing SME level of knowledge among the VM employees. A range of specialty vegetation maintenance services will be engaged in executing the work.

2.4.1 Additional Activities Identified Post-Commencement

In alignment with the Vegetation Management Plan scope and activities required for operation of the utility, the following activities have been added the scope of this program:

- "Reactive" vegetation support for outage, afterhours, and storm restoration along transmission, distribution, and substation facilities.
- "Corrective" support and activities to support re-occurring system reliability needs, customer request, access, and system Patrols along transmission, distribution, and substation facilities.
- "Maintenance" and control of vegetation at substation, material laydown yards, switchyards, and other company facility sites.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct

Vegetation Management

Primary Goals	Objectives	Direct or Indirect Impact
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

Correcting the backlog of untrimmed trees will mitigate public safety risks due to power outages, fallen wires and people climbing onto energized lines.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Increase Service Reliability

The primary benefit of effective vegetation management is to reduce outages caused by vegetation-caused line faults. This is a substantial contributor to the current poor reliability of the system. Improved reliability will improve customer experience. Cleared ROWs will also make it easier to assess storm damage and access sites to make repairs, shortening the duration of outages.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

Current vegetation management practices are focused on reactive and corrective work, i.e., addressing problems after they arise. A well-functioning program will trim vegetation systematically, increasing the efficiency of the workforce and the reliability of the system. A clear VMP will also enable employees to work more effectively and efficiently.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

The poor current conditions of ROWs hampers access to much of the T&D System. By reclaiming these ROWs, access will be improved, thus making Utility Transformation projects financed by federal funds easier and cheaper to build.

Vegetation Management

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

Rights of way currently contain debris deposited during the hurricanes which will be cleared through a better vegetation management process. Reclaiming rights of way will reduce outages in future hurricanes or weather events.

2.6 Program Risks

- The primary risk to delaying the program is that there will be no meaningful improvement in system reliability, and perhaps a further decline resulting in an exceedingly poor level of service for customers. Resources would continue to be wasted on disorganized reactive or corrective maintenance such as hot spotting.
- Inability to meet contractual performance requirements.
- Inability to meet requirements of Vegetation Management Plan required under Act 57-2014, as amended and standards under Act 17-2019, as amended and meet other legal requirements, policies, OMA requirements including Prudent Utility Practice.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	FY2023 Estimate	FY2024 Estimate	FY2025 Estimate	2026+ Estimate
Total Expenditures	**$50.0**	**$60.0**	**$60.0**	**$450.7**
SRP Expenditures	$50.0	$60.0	$60.0	$120.0

3.2 Program Resource Requirements

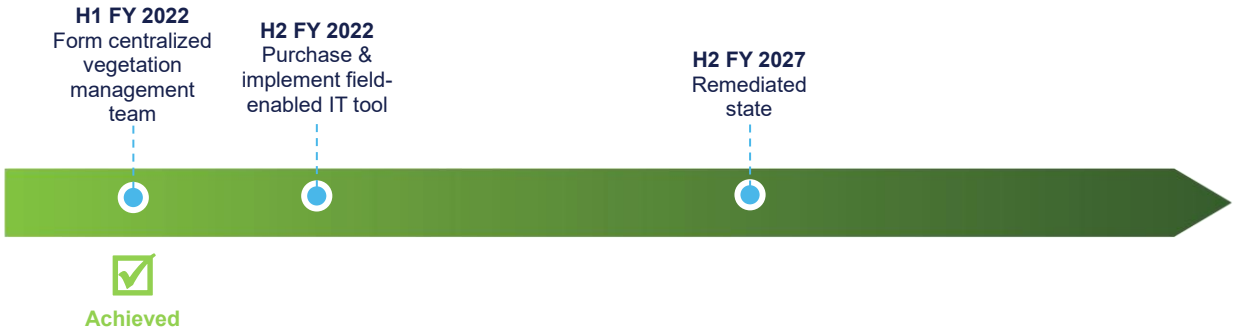
- Recruitment and inclusion of experienced VM SMEs in LUMA's VM team to address any gaps in knowledge and skills to support development of an effective program based on industry standards and best practices
- To the extent dictated by workload and VM related system performance engagement of experienced providers of core and specialized vegetation maintenance services
- IT Tool to support application of performance management techniques across the VM program
- Training of VM workforce on industry standards and best management practices to build required knowledge and expertise

3.3 Estimating Methods & Assumptions

The cost estimate is based on spatial analysis to define the VM workload. Satellite imagery (at two-meter resolution) and other remote sensing data sets were used to develop an initial assessment of VM related field conditions. This was supplemented with high resolution, near real time satellite images of the entire T&D System, which were used to refine the estimate and to evaluate the need for "boots on the ground" field validation, which is ongoing.

Vegetation Management

3.4 SRP Program Timeline & Milestones



Compliance & Studies, Technology, & Performance

Compliance & Studies, Technology, & Performance

1.0 Program Description

COMPLIANCE & STUDIES

The compliance and studies can be broken out into three sections:

1. Several System Studies such as eliminating major cascading outages caused by a lack of proper coordination of protective devices and implementing new procedures and standards to ensure the distribution system complies with regulations and Prudent Utility Practice. This includes performing reviews of current applicable PREPA standards in comparison to relevant codes and standards and developing a set of new practices to be applied along with an implementation plan.

2. Studies, procedures and standards for Substations and Transmission Compliance focused on:

    - Performing engineering studies to identify issues with current infrastructure
    - Developing and implementing new procedures and standards to ensure that transmission lines and substations both comply with codes and regulations and can effectively and safely meet technical requirements
    - Grounding studies and tests to ensure the transmission and distribution substations comply with proper grounding requirements for safety purposes, per IEEE Std 80-IEEE Guide for Safety in AC Substation Grounding and NESC

3. Transmission and Distribution Substation Compliance Projects: Includes the implementation of grounding and environmental projects as well as animal contact mitigation and civil site upgrades (and insulating gravel additions). Consistent with point 2 above, the grounding projects will ensure T&D substation grounding compliance with IEEE Std 80- IEEE Guide for Safety in AC Substation Grounding and NESC on applicable pressure vessels and circuit breakers in the system, annual assessments will be completed by operations and certifications validated as per PR Regulation 17, “Reglamento para calderas y recipientes a presión”.

TECHNOLOGY

From a distribution technology perspective, this program will support the completion of distribution planning and protection studies, as well as the production of hosting capacity information for public and internal use. This program will also procure power quality monitoring equipment and meters for each district. Software procured and implemented under this program includes advanced planning tools that will:

- Identify reliability issues and assess appropriate actions
- Forecast load, distribution generation and technology impact on grid performance
- Provide updated hosting capacity maps

Compliance & Studies, Technology, & Performance

With respect to transmission technology, this program will improve the mechanisms to collect digital data with Technology Monitoring Systems to enable access to critical assets, such as high voltage transformers and battery banks for the 230 kV and 115 kV electrical system backbones. In so doing, these technologies will support the Asset Management function, providing information to optimize equipment performance and maintenance. Specific examples include deploying battery monitoring systems at critical substations, conducting remote asset condition assessments for high voltage transformers using DGA monitors to increase transformer performance, all geared towards informing preparation of timely maintenance plans and preventing unexpected outages.

PERFORMANCE

These activities include the development of processes and tools to measure and report KPIs and other performance metrics along with establishing performance baselines and targets. These processes and tools address those KPIs mandated under the T&D OMA as well as others deemed necessary to drive system performance.

2.0 Program Rationale

3.0 Initial State & Identified Gaps

COMPLIANCE & STUDIES

A thorough review of PREPA's transmission and substation practices indicates that many industry codes and regulations are currently not being followed and these practices are not consistent with applicable Puerto Rico energy law or policies and/or T&D OMA requirements. Significant work needs to be accomplished to achieve Prudent Utility Practice. A more detailed review identifying required changes will continue to be performed.

Transmission and Distribution System Coordination Studies

PREPA currently did not perform protection and coordination or area studies on a regular basis. Typically, utilities perform wide area coordination reviews on a condition based or a time-based system. Lack of protective coordination on the transmission and distribution system can lead to cascading widespread outages and could even result in public safety issues. This includes either slow clearing or a failure to clear high impedance faults on downed powerlines on the electrical system. This creates serious safety hazards to the public, the potential for the ignition of fires, and/or catastrophic failure of distribution equipment. Further, due to the lack of standards, there is a disconnect between Planning and Protection and Control (P&C) in performing distribution protection studies and no uniformity the use of modeling tools.

Other than the DG interconnection regulations, PREPA had no internal distribution planning standards, and area planning.

Compliance & Studies, Technology, & Performance

Facilities Grounding Compliance

Current grounding at transmission line structures, transmission substations, and distribution substations is poor. As proper grounding at transmission line structures and all substations is critical to protect against shock or electrocution during fault conditions, induced voltages due to overhead electrical circuits, or insulation failure of any electrical equipment along the line or within the substation, this condition can cause a step potential or touch potential hazard to the public and employees. Grounding system deficiencies are also noted for switches and ground mats. LUMA's gap assessment, performed prior to Commencement, identified a few key gaps related to grounding:

- Substation fencing is inadequate, with a few corroded or stolen grounding connections
- Substation ground surfaces have been identified as having insufficient gravel as required by IEEE code for limiting step potential hazards
- A lack of adequate grounding currently occurs throughout the transmission grid, though more precise data needs to be obtained
- Animal contact has caused numerous problems across the distribution network. Bird nests have been observed at high-voltage structures that can cause undesired electrical outages. Some of the previous outages have been attributed to iguanas contacting high voltage live circuits. Distribution lines/feeders and substation equipment have been tripped by rodents eating through protection and control cables.

LUMA estimates that approximately 30 percent of the transmission and distribution substation ground grid systems fall in the high-risk category and require safety and hazard mitigation to achieve remediation. Field inspectors will categorize assets according to their health, based on estimates of condition (likelihood of failure) and engineers will assess criticality (consequence of failure) and assign an asset score from 0 (worst) to 4 (best). Mitigation of risk related to only the highest-risk assets (asset score of 0 and 1) will be incorporated into a remediation plan within 60 days of identification. These will be assets that exhibit the following:

Extreme likelihood of failure, or already failed, and likely to cause:

- A safety impact to the workers or the public,
- Failure to meet applicable legal requirements or policies, including IEEE 80 and NESC, which includes requirements related to safe and reliable utility designs,
- An outage that will be widespread, affecting critical customers, and long duration, such that it is likely to have follow-on safety effects.

All deficient assets will go into a planning process to achieve the objectives defined in LUMA's Recovery and Transformation Framework. The most severe safety risks will be flagged at the time of assessment for immediate mitigation and pushed to the top of the priority list.

Pressure Vessels and Circuit Breakers

Based on LUMA's assessment of the records provided by PREPA, none of the pressure vessels in the system were properly inspected as of the Commencement date of June 1, 2021. LUMA is systematically working to get all pressure vessels inspected and ensure that certifications are compliant with Regulation 17. LUMA will work closely with the regulatory bodies on this process.

Compliance & Studies, Technology, & Performance

For the reasons mentioned above this portion of the program is included in the SRP.

TECHNOLOGY

Distribution Technology

PREPA did not forecast various types of DERs such as PV and virtual power plants (VPP). PREPA also did not perform hourly load forecasts. With the goal to incentivize proliferation of DERs, this gap will widen if no action is taken.

With the current operating environment, power quality monitoring and compliance has not traditionally been a critical activity. As system reliability and availability improves to meet long established industry standards, power quality issues will become more prominent and garner more attention. Power quality analysis is a utility best practice to identify and address grid and customer power quality issues and troubleshooting.

Initial assessments also revealed the following specific issues:

- There is no secondary system voltage rise calculation available to dictate DER hosting capacity.
- Lack of useful performance metrics: improved identification of reliability issues and assessment of project impact will help identify the best projects to improve reliability metrics. Improved forecasting will also help plan the grid for reliability in the future.
- Need for legal/regulatory compliance (Act 17, Section 1.11 and 1.15): There are contractual obligations to provide up to date hosting capacity information to meet IRP requirements

Transmission Technology Monitoring System

Monitoring systems for high voltage power transformers or battery banks have not been implemented at any of PREPA's substations. However, these technologies are essential to support the asset management function, extend the equipment's useful life, reduce electrical outages, and optimize preventive maintenance.

PERFORMANCE

LUMA's initial assessment has identified the following gaps related to performance metrics:

- The system currently does not have proper processes and tools to measure and report KPIs.
- There are no baseline reliability measures for transmission reliability. There is also a lack of processes and tools for analyzing and applying reliability data to identify system improvement opportunities.
- System performance is not linked to the cost of service and planning for capital and operational improvement programs.
- There is limited analysis and categorization of transmission outage data (only 4 months out of the last year). There are also no processes, practices or procedures to help support this work activity.
- The system does not have any overall asset health performance indicators or targets to drive asset strategy or asset replacement activities.

3.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

Compliance & Studies, Technology, & Performance

4.0 Description of Remediated State

COMPLIANCE & STUDIES

Transmission and Distribution System Coordination Studies

In the remediated state, a protection and coordination study on the whole of the transmission and distribution system will have been performed.

Facilities Grounding Compliance

In the remediated state, transmission line facilities, transmission substations and distribution substations as well as equipment, fences, gates, and metal objects at these sites, will be effectively grounded as required for step-and-touch potential hazards in IEEE standards. Corroded or missing fence grounding will have been replaced. The risk of people coming into contact with inadequately grounded surfaces will have been substantially reduced in alignment with Prudent Utility Practice. Substation site surfaces will also have sufficient insulating gravel to eliminate hazardous step potentials for utility workers in accordance with IEEE standards.

In the remediated state, the approximately 30% of the transmission line, transmission substation and distribution substation facilities estimated to be in high-risk condition (0 and 1) relative to grounding will comply with IEEE standards.

Pressure Vessels and Circuit Breakers

- All applicable pressure vessels and breakers in the system are certified appropriately.
- Annual operational assessments are performed.

TECHNOLOGY AND PERFORMANCE

These portions of the program are not part of the SRP.

5.0 Description of Program Completed State

COMPLIANCE & STUDIES

Transmission and Distribution System Coordination Studies

For Transmission and Distribution System Coordination Studies, the program will have achieved a completed state when:

- Transmission and Distribution system standards, planning criteria, and best practices are successfully developed and implemented to ensure compliance with codes and regulations and to support the orderly, cost-effective deployment of the electrical system.
- Planning and P&C studies are coordinated across LUMA.
- Periodic protection coordination review is implemented.

Facilities Grounding Compliance

In the completed state, the following will apply, beyond that which has already been noted for the remediated state:

Compliance & Studies, Technology, & Performance

- Grounding studies are completed: 100% of the transmission substations and distribution substations have ground grid studies and soil resistivity tests completed to meet the minimum acceptable limits of step-and-touch potentials and substation ground potential rise.
- Identified gaps are addressed: Restoration of fencing and ground grid integrity, required gravel to mitigate step potential risks added. LUMA anticipates that 30% of transmission and distribution substation sites will need this work that we project will be completed over a 5-year period.
- Insulated coverings and other devices to prevent wildlife from climbing, nesting or touching live circuitry (various types of cover-ups such as green jacket, as well as off-the-shelf product for most of the cases) are installed at identified substations over a 10-year period.

Pressure Vessels and Circuit Breakers

Remediated state is equal to completed state.

TECHNOLOGY

Distribution Technology

The program will have achieved a completed state when it successfully establishes:

- Implementation of Synergi Reliability and Middle link to account economics and policy.
- Use of equipment necessary to adopt processes, study methods, guidelines, and standards to prevent, monitor and mitigate power quality problems.
- Use of tools needed to allow Asset Management triggered planning studies to include predictive reliability output by using specific software tools.
- Completed feeder hosting capacity studies: For every feeder where DGs/DERs can be installed, a hosting capacity map will be available. These will be updated periodically.
- Use of an online website where customers can instantaneously estimate how large a DG facility they can install. This is based on the premise that the existing system can accommodate it without upgrades.

Transmission Technology Monitoring System

- Smart monitoring systems implemented for selected 230 kV and 115 kV transmission centers battery banks and power transformers
- Transformers' and battery banks' preventive maintenance will be coordinated and scheduled based on assessments of their condition made by using digital data from the monitoring systems.

PERFORMANCE

In the program completed state, the following will have been applied:

- Implementation of an auditable tool to calculate monthly reliability indices in full compliance with IEEE 1366.
- An established baseline for all desired reliability metrics.
- An established baseline, reporting and method to calculate transmission and distribution technical losses.
- An established plan for reduction of losses drawing from distribution automation and grid mod initiatives that include voltage conversion, capacitor banks, etc.
- allow reliability studies and hosting capacity maps.
- Purchase, distribution, and sharing of portable power quality monitors to trained and qualified service personnel and technicians among districts. This will allow them to install, operate and evaluate results in the field.

Compliance & Studies, Technology, & Performance

- Use of LoadSEER to develop load forecasting as part of implementing modern utilities practices, such as data analytics.

COMPLIANCE & STUDIES

Transmission and Distribution System Coordination Studies

- Ensuring system-wide protection coordination in the T&D System.
- Wide area protection and coordination:
  - Creating guidelines, validating of models, validating coordination, inputting setting data and conducting periodic area studies
  - Reviewing area protection coordination
- Distribution coordination and fusing criteria (non-SRP):
- Creation of guidelines and standards for all feeders with a continuous focus on worst-performing feeder's
- Transmission and Distribution planning criteria (non-SRP) – development and periodic refresh of a set of standards and guidelines for:
  - New feeder capacity
  - Mainline capacity
  - Power quality standard (to be made external)
  - Single Line Drawing (SLD) drawing standard (Planning and Operations)
  - Generator interconnection standard (to be made external)
  - Substation capacity standard
  - Rural alternate feeds
  - Distribution voltage limits requirements
  - Guideline for adding new substation breakers
  - Overvoltage risk mitigation
  - Guideline for large urban areas
  - RMS voltage disturbances
  - Voltage unbalance
  - Distribution overhead line capacity
  - Power quality commissioning standard
  - Generator commissioning standard
- Review of the current asset management strategy compared to current industry practices, including development and implementation of the new plan. ISO 55000 standard will be considered industry best practice for the asset management strategy (non-SRP).

Facilities Grounding Compliance

- Thorough review of current applicable PREPA standards and comparison with industry codes, regulations, and best practices including IEEE standards.
- Identification and prioritization as applicable, of the changes to current practices, including the development and implementation of a plan to use the new standards. This will lead to identifying and prioritizing the infrastructure changes that may be required.
- Engineering studies as covered in these programs, such as grounding studies.
- Correction of grounding at identified substations.
- Procurement of required gravel and deployment across facilities.
- Creation of substation testing plan, wildlife protection plan.
- Obtaining internal and contractor resources to complete the work.
- Completion of grounding studies and identify issues.
- Prioritization and completion of repairs/corrections based on level of hazard.
- Prioritization and completion of wildlife protection measures.

Compliance & Studies, Technology, & Performance

- Placing of additional gravel to occur within one year of completing the studies for the specific substations.
- Installation of insulated coverings and other devices to prevent wildlife from climbing, nesting or touching live circuitry.
- Installation of insulated coverings and other devices to prevent wildlife from climbing, nesting or touching live circuitry.

Pressure Vessels and Circuit Breakers

- Validate certifications from an inspector certified by the government of Puerto Rico
- Perform annual operational assessments as per Regulation 17.
- LUMA to work closely with the regulatory bodies to develop and confirm an appropriate process.

TECHNOLOGY

Distribution Technology

- Procurement and deployment of Synergi Reliability and Middlelink.
- Hiring, training and deployment of technologists to use the proposed power quality meters.
- Investigate and employ LoadSEER if deemed beneficial. This will be recommended at 7 – 10 years and relies on heavy penetration of DERs/EV/DR/VPP and hourly demand on large scale. This program also involves heavy IT/OT integration.
- Procure adequate equipment for power quality monitoring (standalone and portable) with a four-to-seven-year time horizon.
- Procure Synergi Reliability, incorporate planning criteria and plan for reliability improvement (predictive reliability) on an ongoing basis.
- Create and periodically refresh and publish hosting capacity maps (many interdependencies, such as Synergi Middlelink, GIS, CIS, AMI, improved load forecast, software procurement, integration, deployment, and training) over a four– to seven-year time horizon.
- Create and deploy on LUMA's portal a voltage rise calculator that provides hosting capacity on the secondary (similar to what the hosting capacity maps provide at the primary). This requires development and integration of a GIS tool on the website. Overall, this project has a four-to-seven-year time horizon.

Transmission Technology Monitoring System

- Comprehensive gas monitoring systems will be added as standard equipment to new 230 kV and 115 kV transformers as part of the Transformer Replacement program.
- Hydrogen and moisture monitoring systems to be added for 50% of existing 230 kV and 115 kV transformers.
- Battery monitoring systems will be deployed at critical substations for enhanced reliability and extended service life for battery banks.

PERFORMANCE

- Perform thorough review of current established procedures related to these metrics. Identify causes for improper information.
- Conduct a detailed analysis to determine organization's requirements for performance metrics.
- Plan, develop and validate a tool and process for reliability reporting in alignment with IEEE 1366.

Compliance & Studies, Technology, & Performance

- Audit tool and process.
- Establish baselines.
- Implement plan for loss reduction.

5.1.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

6.0 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Direct
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☒ **Sustainable Energy Transformation**	☒ Modernizing the Grid	Direct
	☒ Enable the Digital Transformation	Direct
	☒ Enable the Sustainable Energy Transformation	Direct
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Improved grounding and the addition of gravel will have a direct impact on the shock and electrocution risk caused by the present condition inside the substation.
This program will also ensure that protection practices and settings are developed to maximize their effectiveness, remove blind zones, and minimize incident energy (e.g., arc flash).

Objective: Implement Effective Public Safety Practices

Implementing an online transformer monitoring system will have multiple benefits including prevention of catastrophic transformer failures, which can be a public and employee safety risk.
The program will also directly affect people external to the substation, keeping them safe if they come into contact with the fences during fault conditions.

Compliance & Studies, Technology, & Performance

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Will allow the monitoring and remediation of power quality problems to residential, commercial and industrial customers.
The program will enable a more transparent, customer-centric output by allowing customers to self-serve on hosting capacity information.

Objective: Deliver Electricity at Reasonable Prices

Accurate tracking, reporting and analysis of reliability indices will enable more effective planning and prioritization. This will increase reliability and efficiency of the grid and hence also improve the customer experience. Better planning and prioritization will also help to control costs for providing service, thus allowing for more reasonable prices.

Objective: Increase Service Reliability

Improves service reliability by reducing wildlife contact caused outages.
With the implementation of new transmission standards, system reliability will improve over time as the standards are implemented in the field.
This program will increase service reliability because it will help eliminate major cascading outages caused by lack of proper coordination of protective devices.
Monitoring of substation batteries and transformer conditions will help identify trouble spots for preventive maintenance before a major failure occurs, increasing service reliability.
The program will allow gearing of asset management toward prioritizing investments for higher reliability projects.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Improved DER and load forecasts will enable a more timely and orderly deployment of the system.
Having an auditable process for reporting reliability indices allows for more systematic business decisions.

Objective: Enable Employees to Execute Operations Systematically

Planners and designers will have better processes and guidelines to perform planning activities such as construction of new lines, interconnection of new loads, DERs, DG, etc.
Improve operability by studying load transfers, protection, and coordination reviews, etc.
Enhanced grounding will reduce operational requirements at work sites that would otherwise have been required to protect workers.
Both monitoring systems will improve the Asset Management function. They will modernize the condition assessment methods for transformers and battery banks, also allowing employees to operate more efficiently.
Planners will be able to perform more efficiently- following industry best practices and using state of the art tools.

Compliance & Studies, Technology, & Performance

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

Repaired grounding and additional gravel will correct problems caused by hurricanes.
The enhanced transmission standards and studies will improve resiliency as they are implemented in the field by reducing the frequency and duration of outages.
The enhanced distribution standards and studies will help to restore damaged infrastructure and improve resiliency as they are implemented in the field.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Modernizing the Grid

Using state of the art tools to plan DGs, DERs, EVs, energy storage and virtual power plants.

Objective: Enable the Digital Transformation
The battery monitoring systems will aid in:

- Identifying defective cells that could compromise the battery bank integrity.
- Optimizing the preventive maintenance plan.
- Allowing for backup power supply to be available for the protection relays and SCADA system.
- Lowering maintenance costs.
- Streamlining the planning and information to customers will improve the current processes and shorten timelines to interconnect renewables.

7.0 Program Risks

COMPLIANCE & STUDIES

- Improperly protected transmission and distribution systems can cause dangerous step and touch potential hazards during electric system faults and other system abnormalities.
- There is also a risk of injury, possibly fatal, to anyone adjacent to deficient facilities during such conditions.
- Substations whose grounding is not corrected can be an immediate risk to the public and employees under fault conditions. This hazard can also be created by induced voltages and phase to neutral load imbalances.
- Lack of animal guards on high-voltage equipment not only endangers wildlife but reduces the reliability of service.
- Engineering Studies: Electric disturbances can cause a cascade effect affecting customers and equipment (damage) if the proper wide-area protection study is not completed. This study is even more important for a system that is adding significant DERs. The studies are directly related to the stability of the power grid and the optimization of resources. Without implementation, inefficient management of assets and resources will continue because of the lack of a proper and optimized Asset Management Plan and adequate Transmission Planning Criteria.
- Inability to meet applicable legal requirements, policies, or standards.

Compliance & Studies, Technology, & Performance

TECHNOLOGY

Distribution Technology

- Operating with obsolete and antiquated practices and tools will negatively affect grid planning and operations and delay some improvements in system performance.
- Not properly monitoring or addressing power quality concerns will negatively affect customer perception and could increase liability exposure.
- Potential incidents impacting worker and public safety and damage to equipment and facilities.

Transmission Technology Monitoring System

Performing this work will take multiple years to complete. The substations are at risk in the meantime. The main risks are:

- Transformer failures caused by a contaminated dielectric (oil, gas, etc.).
- Improper operation of protection relays.
- Lack of remote control and supervision during power outages.

PERFORMANCE

The primary risk of not moving forward with this program is a failure to meet performance targets that could lead to cancellation of LUMA's contract.

8.0 Program Funding & Timeline

9.0 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$18.3**	**$8.5**	**$8.3**	**$67.4**
SRP Expenditures	$15.3	$7.3	$7.3	$21.9

10.0 Program Resource Requirements

EXAMPLES OF COMPLIANCE & STUDIES

System Coordination Studies

- Wide area protection and coordination (Distribution) – 15 full-time senior level employees for the first 2 years of development and 0.5 full-time senior employee on an ongoing basis.
- Wide area protection and coordination (Transmission) – 16 full-time senior level employees for years 3 and 4 and 0.5 full-time senior employee on an ongoing basis.
- Distribution coordination and fusing criteria – One full-time senior level employee for the first year and 0.5 full-time senior level employee on an ongoing basis.
- Distribution planning criteria – eight full-time senior level employees for the first 2 years of development and 0.5 full-time senior level employee on an ongoing basis.

Compliance & Studies, Technology, & Performance

Facilities Grounding Compliance

- Internal and external contractor resources will be used to develop the required documentation and studies.
- Three engineers (two engineering technicians and one surveyor) will be assigned for each year of the program (carry out studies and plan the work).
- Both internal and external contractors will be used to make necessary repairs.
- Enough suitable gravel to fulfill program needs.

Pressure Vessels and Circuit Breakers

- Internal resources and external contractors to verify current certifications and plan and perform additional certification of pressure vessels and breakers.
- Internal resources perform annual operational assessments.

TECHNOLOGY

Distribution Technology

- LoadSEER – Software and at least one senior FTE per year.
- Power Quality – Equipment (26 meters – 1 per district), and 0.5 senior FTE per year.
- Predictive Reliability Planning – Synergy software and integration; 3 junior engineers per year.
- Hosting Capacity Maps – Software and integration costs; 1 junior engineer per year.
- DER Hosting Capacity Calculator – Computer programmers to develop the system (one senior and one junior FTE-year) plus a junior FTE-year to maintain.

Transmission Technology Monitoring System

- Resource requirements include internal and external contract labor.

PERFORMANCE

- IT roadmap.
- CMMS.
- Distribution SCADA system expansion.
- Improved customer connectivity data in the OMS.
- Consultant for assistance with the technical loss reduction plan.
- Adequate internal and external resources/contractors to perform program work (e.g., assessment, plan, development, implementation, auditing, etc.).

11.0 Estimating Methods & Assumptions

COMPLIANCE & STUDIES

System Coordination Studies

- Estimates for engineering resources prepared based on previous experience, which includes the development of similar standards with other utilities
- Currently assuming use of internal resources. If it becomes necessary to supplement with consultants, the average labor costs may increase.

Facilities Grounding Compliance

Compliance & Studies, Technology, & Performance

For Distribution Sites

- Details of the current state of the grounding systems in the distribution system is not known due to lack of recorded information. An evaluation of electrical facilities will be required to determine the actual state before remedial plans can be implemented. The standards to be used are those outlined in IEEE Std 80- IEEE Guide for Safety in AC Substation Grounding which provides industry guidance on best practices for substation grounding.
- Program for Grounding with a total cost of $22.6M.
- Gravel cost estimated at $1.1M.
- Animal Mitigation costs estimated at $10.6M.

For Transmission Sites

- Estimates are based on previous experience, adjusted for local conditions.
- Studies related to existing grounding systems and remediation were estimated at $7M and implementation costs were estimated at $19M.
- Gravel for Transmission and Sub-Transmission Sites estimated at $6.4M.
- Animal mitigation estimated at $8.4M.

Pressure Vessels and Circuit Breakers

- Estimates for internal resources and external contractors to perform assessments and certification of pressure vessels and breakers based on previous experience.

TECHNOLOGY

Distribution Technology

Estimates have been prepared based on previous experience with similar tools (CYME vs Synergi), previous purchases of power quality equipment and previous estimates for LoadSEER.

We anticipate using internal resources but will possibly need to supplement these with consultants, which may increase average costs.

Transmission Technology Monitoring System

The projects corresponding to this program are expected to be completed by the end of year 10.
Assumptions: Estimating splits based on historical projects:

Category	Percentage
Material	**32%**
Detailed Engineering	**10%**
Site Preparation & Survey	**17%**
Construction	**35%**
Commissioning	**5%**

PERFORMANCE

Estimates based on previous related experience/projects and estimates from supporting departments.

Compliance & Studies, Technology, & Performance

For KPIS Project

- Assuming 10-year project timeline.
- Cost: $200k for the first year of project (one full time employee), $100k/year (~half-time employee) for the remaining years.
- Total Project Cost: $1.1M.

For Technical Loss Reduction Project

- Assuming 10-year project timeline.
- Total Project Cost: $1.01M for the 10-year project.
- 4.5 full-time employees — year ($450k) + $200k consultant = 650k total (divided over first 2 years of project).
- $45k/yr. ongoing (years 3+).

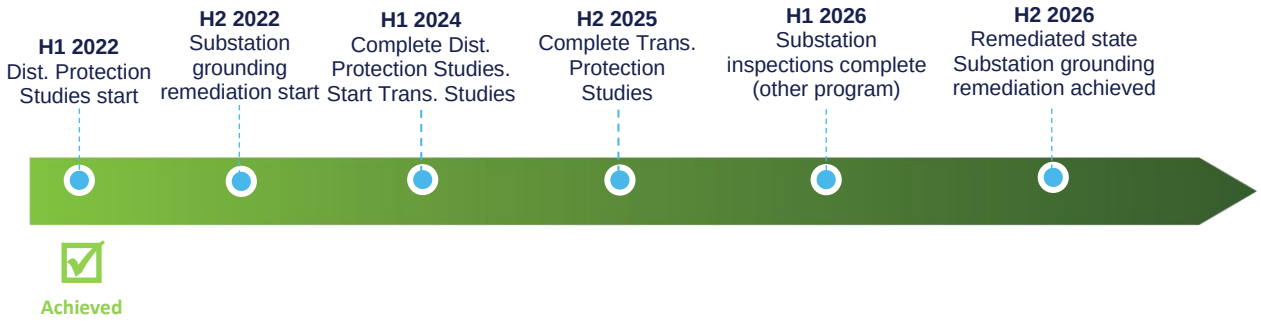
For Other Reliability Indices Project

- Cost: $200 k for the first year of project (one full-time employee), $100 k/year (half-time employee) for the remaining two years of project.
- 3-year project (1 year to implement measurement and reporting, 2 years to establish baseline).
- Total Project Cost: $400 k.
- After initial setup of measures, reporting is included in costs of KPIs project.

For Transmission Reliability Metrics

- Based on prior experience establishing similar reliability reporting, plus time to review data sources.
- Assumes usable data source exists for reporting Bulk Electric System (BES) Delivery Point Interruption, BES Significant Power Interruption and Equipment Reliability Information System (ERIS).
- Assuming 10-year project timeline.
- $400 k for the first year of project (two full-time employees).
- $600 k/year (three full-time employees) for the remaining years.
- Total 10-yr Project Cost: $ 5.8M.

12.0 SRP Program Timeline & Milestones



HSEQ & Technical Training

1.0 Program Description

This program provides HSEQ and technical training to field personnel. During the initial stage, basic technical training will be provided through the LUMA College[1] and HSEQ training conducted by internal subject matter experts and external providers. Personnel will gain technical skills training for field employees to become fully qualified to complete their work safely and efficiently.

Subsequent enhanced technical training will be provided through the LUMA College. Enhanced training modules will be developed and administered based on operational needs for the type of technology being implemented but could include areas such as operation of smart grids, work on energized lines (e.g., hot line and barehand programs), splicing of conductors and helicopter work for transmission repairs.

This program will help to instill a new safety culture across the T&D System, thus reducing safety incidents, bringing the T&D System into compliance with contract standards (including but not limited to OSHA and broader industry standards) and improving overall employee efficiency.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Gap assessments have uncovered the following:

- HSEQ training provided to employees is minimal. Many current safety processes are not OSHA compliant.
- A need to improve the overall safety culture, with existing practices leading to many safety incidents that could have been avoided.
- Expectations and requirements for employees are unclear, contributing to a lack of accountability.
- Currently, a lack of workforce development measures contributes toward non-compliance with industry standards.
- The skilled labor workforce is undertrained (line workers, fleet mechanics, power system electricians, techs, etc.).
- A framework of technical training standards does not currently exist, including lack of apprentice programs, competency assessment programs and in-house training experts:
  - No line worker apprenticeship program exists, generally a four-year program with 8,000 hours that is registered with the US Department of Labor (DOL).
  - Since basic technical training is lacking, employees also do not have the prerequisites for enhanced technical training and such programs do not currently exist.
- No continuing education is completed.
- Current practices may not meet requirements, policies or standards under T&D OMA, Act 57-2014, as amended, or Act 17-2019, and Prudent Utility Practices.

[1] LUMA College for Technical training, LLC will be a separate entity from LUMA but will work in close alignment with LUMA.

HSEQ & Technical Training

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

The primary characteristic of the remediated state is that all field personnel will have received basic HSEQ and technical training to be able to perform their respective functions safely and effectively. Additionally, the following will apply:

- Field practices across LUMA will be in compliance with OSHA standards.
- An Apprentice 1 program will have been established and registered with DOL. All line workers will be actively participating in it or have received the equivalent journey level by grandfathering. This program would include entry-level training and the program would be filled on regular basis to replace turnover workforce.
- Initial onboarding to LUMA safety and work practices for all skilled trade employees will be taking place.

2.3 Description of Program Completed State

In addition to the characteristics noted for the remediated state, the completed state will include the following characteristics:

- Safe work processes are in place and employees are trained and execute work safely and efficiently.
- Employees are more engaged and safety conscious, resulting in a reduction in incidents and OSHA recordable rates, meeting performance metric targets.
- Accurate data is reported, analyzed, and used to identify leading indicators and support ongoing HSEQ campaigns.
- Basic technical training will be administered on an ongoing basis across field employees.
- LUMA would be consistently filling pre-apprentice, apprentice, and advanced / continuing education and training, with all line workers and field personnel continuing to be actively in or having completed an apprenticeship.
- LUMA would have successfully achieved implementation of continuing education to meet regulatory requirements and improve workforce safety and efficiency.
- Enhanced technical training programs will be available for employees on an ongoing basis. The administration of these programs will be agile, meaning that the trainings can be upgraded, modified, and tailored to employee functions, technology requirements and the needs of the organization as new technologies are added and implemented. Potential training modules include operation of smart grids, control/operation of Advanced Metering Infrastructure (AMI), splicing of conductors, energized line operations (e.g., hot line and barehand programs) and helicopter work for transmission. Most of these programs will be administered through the LUMA College and supplemented by subject matter experts (SMEs) based on training needs.

2.4 Program Activities

- Initially establish a process to select employees for priority HSEQ training and subsequently train those employees
- Ensure work processes align with training objectives
- Implement documented work processes

HSEQ & Technical Training

- Develop an HSEQ standard training curriculum including criteria, objectives and outcomes that meets industry standards and best practices
- Training of employees according to the new HSEQ training curriculum
- Determination of internal groups' HSEQ and technical training needs and expectations as determined by working closely with them
- Identify, prioritize, and complete onboarding training (year one)
- Consistently fill pre-apprentice program by recruitment throughout Puerto Rico
- Develop, register, and operate DOL apprenticeship
- Register and complete apprenticeships for line workers
- Prioritize training with internal campaigns
- Commit internal resources toward refresher training and continuing education; run programs continuously
- Develop course work for enhanced technical training across LUMA functions including technical services, vegetation management, fleet, and material management
- Develop specific training programs for enhanced technical training for line workers and other field personnel
- Administer both basic and enhanced technical training on an ongoing basis for employees based on their functional requirements

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Indirect
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Indirect
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Indirect
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect

HSEQ & Technical Training

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

Basic HSEQ training across the workforce leads to a safer workplace. Improving safety culture results in a reduction in incidents and (Occupational Safety and Health Administration (OSHA) reportable claims.

Technical training programs will increase safe work processes and efficiency by upskilling all skilled labor employees through delivering training focused on knowledge, skills, and behaviors of LUMA employees. Courses include grounding, bucket truck rescue, OSHA, and others. A better trained work force will also allow for more timely identification of public safety issues.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Increase Service Reliability

This program will enable employees to respond to outages and customer needs more efficiently, delivering both better service and an improved customer experience.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

Properly trained employees will be able to deliver higher quality project work in a more systematic manner. Better trained employees through this program will also reduce downtime and overtime requirements and increase employee productivity, along with reducing the amount of error and re-work. Training programs will further help improve work quality which will translate into better project delivery.

Increasing data tracking and reporting on HSEQ training will lead to increased accuracy of performance metrics. Clarifying training expectations and requirements will increase accountability and contribute to better causal analysis and follow-up. Improving workforce development will allow LUMA to comply with industry standards.

PRIMARY GOAL: SYSTEM REBUILD AND RESILIENCY

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

HSEQ & Technical Training

Better trained employees will help to restore damaged infrastructure and allow for greater resilience in the event of an emergency.

2.6 Program Risks

An unskilled workforce is a danger to itself and others working near them. Providing training for all employees from novice to skilled personnel is essential to ensure the safety of employees and the general public. With current health and safety metrics far worse than industry averages (nine times worse than average utility standards) and the lack of basic HSEQ training being a primary contributor to this situation, continuing with the status quo poses a major safety risk likely to result in serious injury or fatality. At best, reducing safety incidents and meeting performance targets will be difficult without a trained and competent workforce.

In the event of an emergency, correct training will allow LUMA employees to be better prepared to respond to outages and make the necessary repairs to restore service to customers quicker than in past events. Without this program, employees could remain underprepared for such an emergency.

Additionally, statutory and OSHA regulatory compliance may be adversely affected.

Lack of training would also not allow LUMA and its employees to make much needed customer service gains, and customers will continue to see extended wait times for outages. Not pursuing a strong training program will also result in increased costs of service due to employee downtime and contractor costs.

There is also a substantial downside risk of failing to pursue enhanced technical training (i.e., top quartile) programs. As new technologies are implemented throughout the LUMA system, employee needs will continue to evolve, and enhanced training will be required to adapt.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$15.0**	**$7.5**	**$5.0**	**$21.0**
SRP Expenditures	$15.0	$7.5	$5.0	—

3.2 Program Resource Requirements

Employees will use their personal tools, equipment, and Personal Protective Equipment (PPE) for training. Training manager and coordinators (internal and external) will administer training programs. LUMA College will provide technical training. Particular training modules will require trainers, writers, and training consultants, along with training materials, props and training specific technologies. Specific training modules may have dedicated location requirements, with overnight stays and travel depending on the training location.

HSEQ & Technical Training

3.3 Estimating Methods & Assumptions

These programs and estimates were developed by comparing LUMA's completed future state to a typical US utility training program. Approximately 2,000 employees need HSEQ and technical training and all remaining LUMA employees will require a basic level of training and orientation. Costs were updated based on operational data for the FY2022.

Based on costs at other campuses, these estimates were developed using the number of LUMA employees, the LUMA College's expected capacity and typical costs for training services at parent companies and outside vendor costs. Estimates were also informed by applicable standards and codes, including OSHA, the Institute of Electrical and Electronics Engineers (IEEE), prudent utility industry standards, manufacturer recommendations and planned LUMA safety practices, programs, and work methods. Training frequency was based on industry standards or regulatory requirements.

HSEQ and technical training requirements may change over time and shifting priorities could potentially result in the development or removal of course contents.

3.4 SRP Program Timeline & Milestones



T&D Fleet

1.0 Program Description

The T&D Fleet program includes a range of activities and investments to bring the current fleet up to industry standards including vehicles, and equipment. Additionally, activities will be focused on initializing and improving processes for data collection, repair and maintenance of these assets.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA will be charged with the overall management of approximately 3,230 vehicles. The vehicles range from light and heavy-duty vehicles to equipment for construction and material handling. As summarized in the following table, the vehicles range from light and heavy-duty vehicles to equipment for construction and material handling.

Category	Description	Count
0	**Small SUV**	7
1	**Jeeps, Medium, Large SUV**	429
2	**Small/Med Pickup**	363
3	**Large Pickup, Other**	513
4	**Platform Truck, Other**	379
5	**Pickup w/ Bucket**	349
6	**Bucket Truck, Digger Derrick**	400
7	**Trailers, Other**	485
8	**Small/Medium Pickup**	304
9	**Heavy and Other Equipment**	1
Total		**3,230**

There are also 25 land maintenance and repair shops distributed across the island. Based on LUMA's gap assessment, the current state of facilities and the maintenance and operation of the fleet reflects an overall maturity rating ranging between "unfocused" and "aware." The "aware" maturity rating, at the upper end of the current assessed range, means that in some cases PREPA exhibits a basic understanding of the need to address these areas and may or may not be in the process of deciding how best to or starting to apply them. While some of these maturity ratings are due to underinvestment, many are related to processes and controls that are not in place. In several areas (most notably those areas pertaining to compliance with the Puerto Rico Commission on Public Safety (CSP) /US Department of

Transportation (US DOT), OSHA and/or ANSI requirements), there is currently no evidence of plans to put processes and controls in place to work toward meeting the standards required.

The current fleet is mainly comprised of aging and deteriorating assets and facilities. In fact, 90 percent of the fleet is beyond the industry standard for expected life (e.g., 6-7 years for trucks and 10 years for heavy duty vehicles). This has led to ineffective and increasingly costly maintenance, exacerbated by poorly maintained or missing tools, ineffective and inconsistently applied practices and standards, and increasing training requirements for employees. Maintenance of the fleet has also suffered due to an outdated and unused fleet management information system which has led to a lack of information regarding the fleet condition, maintenance needs, inspections due, maintenance records and additional difficulties in meeting regulatory mandates for maintenance inspections and record keeping. Gaps exist in all areas of fleet management.

Of critical concern are:

- Currently most, if not all the assets in the fleet do not meet Puerto Rico CSP / US DOT or OSHA / ANSI requirements.
- Maintenance and inventory management practices, processes and procedures are inadequate, outdated and require major overhauls.
- Short- and long-range fleet capital lifecycle planning is ineffective, both in process and execution.
- The general level of training for basic fleet management activities is low or non-existent.
- Annual inspections of the fleet are not current and therefore data regarding the condition of specific fleet assets (i.e., inspection and maintenance records) are broadly inaccurate, and in most cases missing.
- PREPA also reports an urgent need for more trained mechanics. Based on the Utilimarc Standard for maintenance or repair hours required per vehicle, the amount of mechanics within the PREPA Fleet Management organization totals only 70 percent of the average for other North American utilities. There also appears to be, at least in the short term, no indication that the requisite number of qualified mechanics will be engaged to make up this shortfall or to outsource the appropriate amounts of work necessary to properly maintain all equipment.

LUMA notes that the above statements are based on a high-level review (i.e., not a detailed inspection) of approximately half of PREPA's fleet assets. From this, lacking any detailed testing and maintenance records, LUMA has determined the general state of these assets from a condition and operability perspective, and projected estimated repair vs. replacement percentages across PREPA's entire fleet. These projections / assumptions will continue to be reviewed and revised as LUMA proceeds towards revitalizing the fleet.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

The following parameters define the remediated state for fleet operations, addressing the activities required to comply with applicable laws and regulations and assure the safe operation of fleet assets:

- Compliance with all of Puerto Rico's Department of Transportation and Public Works (DTOP), CSP and federal requirements including US DOT, Occupational OSHA and ANSI regulations or standards.

- Related to the above, performance of all applicable inspections and maintenance in accordance with manufacturer recommendations.
- Verification of successful dielectric testing on all operating boom trucks.
- Full implementation of inspection and maintenance records collection and storage procedures in compliance with US DOT requirements. This includes the use of a Fleet Management Information System (FMIS) that stores the records but also enables communication with fleet cost coding and digital connection with telematics, fuel purchasing and other fleet management systems.
- Completion of applicable training and qualification of all mechanics and operators maintaining, driving or using fleet assets. Mechanic training will include hydraulic maintenance certifications.
- Reduction of maintenance backlog to where less than 10 percent of the trucks are in the shop at any given time.

2.3 Description of Program Completed State

The fleet program addresses the major deficiencies identified in the gap assessment and expanded upon in the fleet operational plan. Included in the plan are funds for replacement and refurbishment of an aged fleet in poor condition, projects to enhance data acquisition and tools to support better decision making and management in the future.

In the completed state, the fleet will be operating in accordance with industry norms. This includes conforming with all applicable laws and regulations, regular inspections and maintenance of fleet equipment, full training of all mechanics and refresher training for operators, implementation of fuel management practices and owning assets that operate within their useful lives (i.e., a steady and consistent replacement cycle for aging fleet assets).

2.4 Program Activities

There are 14 key activities that comprise the overall fleet program.

The T&D Fleet program includes activities to implement regimented testing and inspection processes for all fleet assets, assuring compliance with Puerto Rico's DTOP, CSP, US DOT, OSHA, and ANSI standards, along with recommended inspection and maintenance requirements recommended by the equipment manufacturers. This project will address practices for both daily inspection and testing activities (preventive maintenance) and develop / apply criteria and applicable steps to affect major repairs.

Additionally, capital acquisition of new vehicles to replace those that have passed the point where they can be operated reliably, safely, and cost-effectively is required. This is the largest cost activity and is in response to a substantial backlog of vehicles that are already beyond end-of-life expectations. To make this expenditure feasible, this program must spread replacements over a period of ten years. PREPA's current expenditure levels are less than $3 million per year. We estimate that capital acquisitions of about $42 million per year over ten years is required to bring the current fleet makeup up to industry standards.

We must suspend the use of all deteriorated or aging fleet assets that are untested or uninspected, or in an otherwise analogous state until they can be thoroughly inspected, tested, and repaired in a manner that brings them into the minimal legal requirements set forth in regulation by DTOP, CSP, US DOT, OSHA, and ANSI. There would be an ongoing unacceptable risk associated with operating such assets

prior to all testing and inspections being completed, and all aged or deteriorated fleet assets are repaired or replaced.

Additional near-term projects in the T&D Fleet program include:

- Improvement of the current process for sourcing parts, approving third-party repairs, approving purchase orders for parts and repairs, and the usage of third-party vendors that will reduce the current maintenance backlog.
- Implementation of a regimented fleet fuel management and purchase program.
- Full deployment of a regimented fleet telematics system.
- Implementation of programs and associated processes for handling vehicle and equipment waste.
- Installation and/or repair of hoists, mechanics' tools and equipment at fleet shops.
- Assessment of all fleet shops to identify deficiencies and perform facility and structural improvements at all fleet shops.
- Ensure compliance with DTOP, CSP, US DOT, OSHA and ANSI standards, along with recommended inspection and maintenance requirements from the equipment manufacturers.
- Deployment of an FMIS to track maintenance records for all fleet vehicles and preventative maintenance programs.
- Removal from fleet shops of end-of-life fleet, obsolete inventory, all other non-functional equipment, hazardous waste, and other detritus.
- Rebranding of PREPA fleet to identify it as part of LUMA, as specified by US DOT (i.e., that commercial motor vehicles display the company name and US DOT number).
- Installation of double-walled fuel tanks at all 25 fleet shops to serve as an emergency supply for day-to-day operations, aimed at improving efficiency for line workers, as well as reducing the risk of theft at the retail. This will also allow for additional fuel to be stored for use during storm seasons.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Direct

T&D Fleet

Primary Goals	Objectives	Direct or Indirect Impact
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Indirect
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Reduced risk of safety related incidents since vehicles are routinely inspected and properly maintained, operator and mechanic training is improved, and the oldest and worst condition fleet assets are retired.

Objective: Implement Effective Public Safety Practices

Fewer accidents and equipment malfunction due to better maintained fleet assets and well-trained operators.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Improved response time for customer service due to more efficient routing via telematics (e.g., routing of the closest available crew to address a customer outage).

Objective: Increase Service Reliability

Reduced service restoration times, as measured by SAIDI (average customer minutes out of service) and improved fleet responsiveness, particularly during major events.

Objective: Deliver Electricity at Reasonable Prices

Proper maintenance and fleet lifecycle replacement practices will reduce required spending on fleet maintenance as well as decreasing the labor downtime associated with inefficient means of transportation for line crews.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

The implementation of a FMIS provides visibility to key elements that define the operability (current state) of fleet assets.

T&D Fleet

Objective: Pursue Project Delivery Excellence

Improve crew operating efficiency by providing the right vehicle and/or equipment for the job.

Objective: Enable Employees to Execute Operations Systematically

Reduced overtime due to availability of functioning fleet assets during regular working hours. Current work rules allow line workers to go home with pay when their trucks are undergoing repairs since spares are not available to use while trucks are in repair. By bringing vehicles up to industry standards, truck downtime will be reduced, thereby increasing efficient use of standard working hours for line crews.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure

Improve crew operating efficiency by providing the right vehicle and/or equipment for the job.

2.6 Program Risks

Absent this program, the current condition of fleet assets, lack of basic staff training and inconsistent and ineffective maintenance practices pose a substantial and continuing risk of safety related incidents. Given the need to continue to operate poorly maintained assets over an extended replacement and repair period, provisions for improved basic training and industry standard operating and maintenance practices can partially mitigate these risks. These provisions will be substantially reduced over time, once the fleet and its associated maintenance and repair practices are aligned with the US DOT regulations regarding driver / operator safety, and/or applicable ANSI or OSHA Standards for testing and inspecting major equipment have been met.

The necessary continued operation of a deteriorating fleet over a phased implementation period also has risk implications, which again will be mitigated as aging fleet assets are replaced and effective maintenance and repair practices are put in place.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$12.2**	**$28.7**	**$24.7**	**$263.5**
SRP Expenditures	$12.2	$28.7	$24.7	$105.9[1]

[1] **Per Timeline presented in Section 3.4 (below), LUMA is projecting reaching the remediated state during FY 2028.**

T&D Fleet

3.2 Program Resource Requirements

LUMA anticipates a shortage of mechanic trainers in Puerto Rico. In the short-term, LUMA plans to import trainers, while in parallel exploring the option of establishing courses and certifications needed for mechanics at a local mechanic college.

For equipment with long-lead times, we are working with Materials Management and Procurement to determine optimum approaches for ordering and maintaining inventory of such equipment for our most critical fleet assets.

3.3 Estimating Methods & Assumptions

The ongoing capital replacement and refurbishment project, which represents the bulk of this program, is estimated using a Lifecycle-Based Replacement Forecast by asset class. LUMA's estimates assume an economically useful life for various fleet asset classes based on normal industry practice. The actual replacement values originate from Appendix G1 of Sargent and Lundy's Conceptual Transmission and Distribution 10-Year Capital Investment Plan for Reliability.

3.4 SRP Program Timeline & Milestones



Tools Repair & Management

1.0 Program Description

This program focuses on a PPE and tooling plan to address safety needs along with putting in place a better system for managing PPE and tools. In addition to acquiring the needed PPE and tools, this program includes implementation of a centralized Tool and Equipment Crib system to improve inventory management, tool maintenance, tool supply and coordination and oversight of tool and equipment use.

2.0 Program Rationale

2.1 Current State & Identified Gaps

LUMA is responsible for the safe operation of the Puerto Rico T&D Electrical System which includes the safety of employees and the general public. Through our gap assessment and site observations we identified PREPA's T&D Operations current tooling system is well below prudent utility safety, OSHA and IEEE standards. This wide gap leaves both employees and the public at risk of injury or fatality. PREPA lacks both an adequate tool maintenance program and a dielectric insulated tool program, a basic requirement to be OSHA compliant and keep employees safe. PPE and tools are a foundation for all workers in safety sensitive positions and current PPE and tools are not sufficient to keep LUMA employees safe.

LUMA's new T&D Operations organization will consist of approximately 1,100 field based employees that require safe PPE and tooling for approximately 80 fleet units. Listed are some examples of PPE and tools: Fire retardant clothing (FRCs), rubber gloves, potential indicators, metering testing equipment, live line sticks and rubber goods, ground chains, jacks, grips, tampers and jackhammers.

LUMA plans to purchase all the highest safety priority PPE and tools to ensure the employees can work safely and follow all OSHA rules as early as possible in the commencement period, and then every year after, targeting worn-out / failed tools or lower priority tools.

Currently PREPA operates their own dielectric testing facility with the intent to provide dielectric testing of rubber gloves, rubber goods, live line tooling and fleet equipment (booms). This department currently operates well below the needs of the organization due to factors such as the following:

- Lack of adequate employee training and testing equipment
- Inadequate size of facilities
- Inadequate processes, practices and inventory

In August 2020, the recertification of the dielectric testing equipment expired. This prevented recertification of all rubber gloves throughout PREPA. Personnel could not work on the system until the situation was rectified. This situation led to increased cost, negative employee morale and increased customer outages, all due to an inability to carry out planned maintenance.

PREPA uses significant tool and fleet resources to carry out their capital, operations and maintenance programs. Currently, workgroups of field personnel throughout Puerto Rico are responsible for the initial

supply, ongoing maintenance and testing of their tools. Each workgroup also manages a significant inventory of equipment with specialized items that are required to perform certain work on an ad hoc basis, but are not necessarily used in day-to-day activities.

The lack of a department/function to oversee and manage the tools department is a leading cause of the current inefficiencies, added costs and inability to respond to customer needs. Due to lack of inventory management and control, tools are frequently lost, stolen, misplaced, hoarded and poorly maintained.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This PPE and tooling plan will address the major safety and OSHA deficiencies identified in the gap assessment and site assessments. Included are funds to replace aged and purchase missing PPE and tooling that will allow LUMA to meet Prudent Utility Practice and OSHA standards.

In the remediated state, T&D field employees will have the required necessary PPE and tools to safely operate the complex and hazardous electrical system which complies with LUMA and OSHA standards. This includes conforming with all applicable laws and regulations, along with regularly inspecting, testing and completing annual certifications on tools which will keep employees safe and increase the life expectancy of those tools. This will reduce the need for replacements, lowering operating costs. The PPE and tools will also be key for LUMA to quickly respond to any large-scale events or disasters that affect the electrical utility system.

As part of the remediated phase, LUMA will also implement a dielectric testing program for testable tools that will ensure all rubber gloves, rubber goods, live line tools and fleet equipment (booms) will be ready and available for LUMA teams. This program will include a requirement to migrate the physical testing of these goods to a third-party vendor.

2.3 Description of Program Completed State

In addition to the aspects of the remediated state above, the completed state will include implementation of the tool inventory and tracking management program, which proposes implementing a centralized Tool and Equipment Crib system to improve:

- Management of inventory levels
- Tool maintenance programs
- Tool supply and coordination
- Use of certain tools and equipment

This program will develop a tool and equipment management system that promotes cost efficiencies by securing competitive pricing for tool purchase, delivery, maintenance, refurbishment, and testing. It will also implement new initiatives, such as a barcode scanning system and inventory management system (IMS) to track these items and their maintenance programs. The program will introduce efficiencies and improve utilization factors for common use items by implementing a centralized system to manage inventory levels and maintenance programs for tools and equipment.

Tools Repair & Management

The first phase of implementation will focus on inventorying all tools and prioritize the purchase of required tooling.

The introduction of a tool inventory management system will allow for:

- 10% improvement to General Plan and Elevation (GP&E, i.e., capital) budgets
- Improved use of high criticality tools
- Improved visibility of low use tools
- Reallocation of some tasks from field workgroups to the dedicated Tool & Equipment Crib
- Reduced cost for testing (~50% reduction)
- Development of a purchasing agreement for new tools
- Tracking of assets using a barcode scanning program
- Regular pickups and deliveries to the field locations

The introduction of an equipment inventory management system will allow for:

- Improved visibility and use of specialized equipment (low use equipment)
- Coordination and dispatch of equipment to field locations as required
- Single point of contact with LUMA Fleet Services for specialty equipment maintenance

2.4 Program Activities

- Complete a current employee PPE inventory and health assessment
- Complete a current equipment tool inventory and health assessment
- Compare current PPE and tool inventory against LUMA's new requirements
- Prioritize damaged or missing PPE and tools
- Implement a dielectric test program on all dielectric tools and equipment. Immediately test all tools that have not been tested to LUMA standard required timelines.
- As per OSHA, ensure all rated equipment meets manufacturers recommendations
- Purchase all high priority PPE and equipment necessary for the employee to work safely
- Replace worn-out or missing equipment to increase further employee safety and increase worker productivity
- Implement training program to safely operate and maintain PPE and tools
- Develop tool work methods
- Track and inventory all tools
- Purchase FRC uniforms for all field-based employees
  - Purchase of a tool management program
  - Inventorying of all tools, which includes barcoding certain types of equipment
  - Completing an analysis of current and future work to determine tooling needs versus the number of trained personnel, followed by comparing this to industry best practices
  - Setting up and hiring a team to manage the program
  - Competitively tendering a contract for a third party organization to complete all required dielectric testing needed for LUMA
  - Development of a required list of dielectric tools for annual certification programs and purchasing them
  - Relocation of specialized/less frequently used tools and equipment to central locations for maintenance, storage and redeployment
  - Set up of vendors for high volume / low cost tools

Tools Repair & Management

- Development of efficiency metrics such as amount of deployment, transportation, lost or missing tools, and damaged tools (including cost of repair)
- Develop an annual tools maintenance, replacement and additions budget

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Indirect
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

The acquisition of safe and proper PPE and tools for employees will enable compliance with laws and regulations as well as LUMA's and OSHA's own rules.

This program will lead to a reduction of risk of incident or fatality to employees.

Tools Repair & Management

Using the correct tools will increase correct worker ergonomics and reduce numerous minor injuries.

By using appropriate PPE (e.g., FRCs, fall arrest, rubber cover up, etc.), employees are better protected.

Dielectric tools and equipment tested to meet LUMA's dielectric testing protocols will help improve safety for employees.

Objective: Implement Effective Public Safety Practices

Appropriate PPE and tooling will allow employees to respond quickly and efficiently to downed lines, traffic accidents, etc.

The correct PPE and tools will allow LUMA to be better prepared for a safer response to future emergencies or disasters.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Improved customer service serving to improve the LUMA brand – the tool crib can dispatch required tools to personnel upon request, allowing them to complete jobs for customers faster.

Reduction of third-party damage due to climbing on customer's property.

Increased positive visibility through use of appropriate PPE, uniforms and employees not borrowing customers tools to complete work.

Objective: Increase Service Reliability

Better tools lead to better, longer lasting repairs, reducing faults and contributing to service reliability.

Having the correct tools at the right time will allow employees to deal with situations such as outages much quicker.

In the event of an emergency, disaster or catastrophic event, correct tooling will aid the LUMA employees to be better prepared to respond to outages and make the necessary repairs to restore the customers quicker than past events.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Decreased O&M maintenance budget as tools are maintained in a controlled environment.

Decreased amount of stranded tool assets (every location has a specific tool that is only used a few times a year).

Less downtime for employees due to inadequately operating tools.

Objective: Pursue Project Delivery Excellence

Decreased capex tooling budget for replacements and end of life equipment.

Tools Repair & Management

Objective: Enable Employees to Execute Operations Systematically

Reduced overtime due to availability of tools, employees having the right tools with them or able to find them quickly.

Increased productivity due to tools working better and reduced time wastage due to lack of correct tooling or lack of timely certification of equipment life.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Added benefit of correct and available tooling is their deployment on projects that use federal funding. Increased productivity of employees, reduced time wastage and work done more effectively increases the efficiency with which funding is deployed by reducing waste and inefficiencies.

Objective: Restore Damaged Grid Infrastructure

The adequate and approved live line PPE and tooling available will also help decrease the number of planned outages that customers will face as crews make the necessary repairs to the system.

Objective: Improve Resilience of Vulnerable Infrastructure

Correct and available tooling will assist LUMA to respond to outages quicker and make the necessary repairs which will lower SAIDI.

2.6 Program Risks

There is a substantial downside risk to failing to pursue this program. Employees will not have the PPE and tools to safely operate and maintain the electrical system. LUMA will not be in compliance with current laws and OSHA regulations. In this scenario LUMA anticipates the following specific outcomes:

- Increased customer wait times for outage resolutions
- Increased O&M costs due to employee downtime and lack of repairs
- Increased cost of contractors due to higher demand
- Dielectric tools not being tested as per LUMA's dielectric testing practice and OSHA's rules
- Purchasing of duplicate tooling due inadequate inventory tracking
- Increased failure of specialized tools due to lack of training and poor maintenance

Furthermore, the lack of safe and correct PPE and tooling will hinder LUMA's emergency response readiness and, in the event of a large scale event, the length to time to make critical repairs to the system will not improve.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$6.0**	**$6.8**	**$4.8**	**$27.7**

Tools Repair & Management

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
SRP Expenditure	$6.0	$6.8	—	—

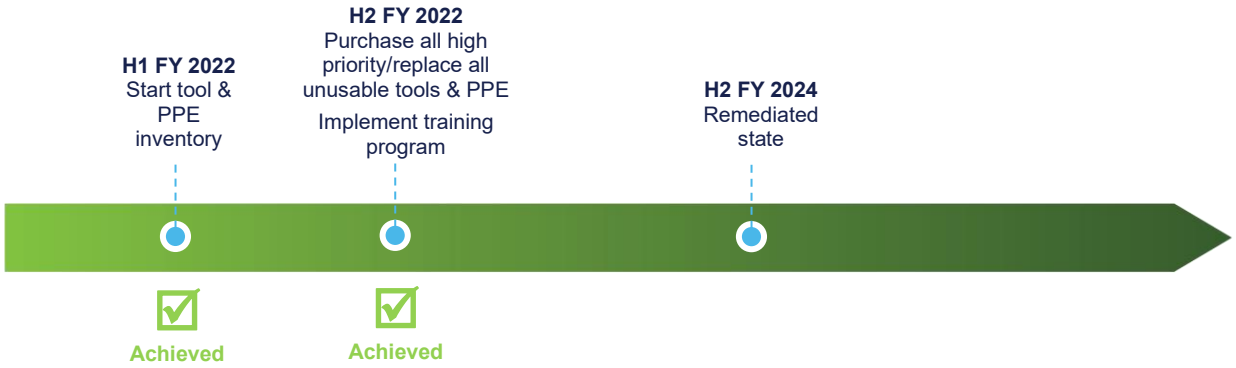
3.2 Program Resource Requirements

Funding to purchase tools and conduct the necessary training.

3.3 Estimating Methods & Assumptions

- Applicable Standards and Codes:
  - OSHA
  - IEEE
  - LUMA's Safety Practices, Programs, Work Methods
  - Prudent Utility Industry standards
  - Labor law
  - State Law
  - Manufactures recommendations
- In-Service Date:
  - 2 weeks after commencement, then prioritized spend over the calendar year. Then annually at the beginning of the fiscal year.
- Program Standards or Requirements:
  - LUMA's safety standards
  - LUMA's Safety Management Systems
  - LUMA's work methods
  - LUMA's training programs
- Contract or internal resources:
  - Approximately 1,134 field/technical employees
  - 800 pieces of fleet that will need to be properly tooled
- Historical program information:
  - PREPA tool inventory (waiting on RFI)
- Support from scheduling and estimating

3.4 SRP Program Timeline & Milestones



Asset Data Integrity

1.0 Program Description

This program is targeted at assuring the integrity of key asset data, with a focus on GIS and CMMS. The program works with stakeholders to identify data requirements, determine process and templates for storing data and update asset data systems with data gathered from asset assessments. These systems and the integrity of their information are fundamental for accurate modeling, operations and planning of the T&D System.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

There are significant gaps in PREPA's existing GIS and associated processes. There is a large backlog of work stretching back a decade that has not been captured in the GIS. The accuracy of some of the existing GIS asset and connectivity data is in question. This negatively affects the function of downstream systems that depend on this data, such as outage tracking, planning models, protection coordination models, reporting and mapping requirements. The GIS data base is the key source of data for all other modelling programs. Without accurate data, the ability to effectively plan, coordinate and protect the T&D System is compromised. Key processes, automations, and integrations are not in place, greatly reducing work efficiency. The lack of accurate GIS data and maps has the potential to result in incorrect mainline switching or improper identification of circuits leading to safety issues.

PREPA currently lacks a CMMS for tracking assets and maintenance, and instead perform this through manual informal processes and an MS Access database that are unreliable and have outdated information. Asset practices are run to failure with no systems in place to enable preventive maintenance programs. There is no evidence of asset costing being tracked.

The fleet management system is out of vendor support and capabilities are not fully leveraged.

Overall, there is no central repository in use to manage assets and compatible units, and data in the repositories that do exist are not considered reliable.

Act 17-2019, as amended, requires the modernization of the T&D System be achieved through specific improvements to the T&D System which will require obtaining system data through an effective and accurate GIS system. This in turn provides information for accurate modeling, operation and planning of the T&D System. Additionally, safe operation of the T&D System is not possible without a fully functioning GIS system. The GIS system will ensure that the correct asset and connectivity data will be available for safe operation and maintenance of the grid.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

Asset Data Integrity

2.2 Description of Remediated State

This program will follow the requirements set forth in the T&D OMA, Act 17, and Act 57. The remediated state will have been reached when a CMMS has been implemented, and when GIS and CMMS data have been validated and entered for transmission lines and the priority distribution lines as determined by the assessment and assessment work. This includes all critical asset information, including switching, line length, conductor size, structure type, etc. This information is required for accurate modeling, operation and planning of the T&D System.

2.3 Description of Program Completed State

The program completed state will have been reached when key standards, processes, templates, and tools have been put in place, and when one hundred percent of the validated data from switchable assets and main lines has been entered into the GIS and CMMS. This includes all critical asset information, including line length, conductor size, structure type, etc. This information is required for accurate modeling, operations and planning for the T&D System.

2.4 Program Activities

- Configuration of an enterprise asset management solution for transmission and distribution assets – leverage a phased approach to implementation based on asset criticality and then extend to other asset categories
- Development and tracking of asset management programs to enable the transition from run-to-failure to preventive maintenance based on asset criticality
- Entry of all GIS and asset data gathered in the line and pole assessment programs and, for selected lines, into the GIS and CMMS using newly developed LUMA processes, templates and tools
- Entry of all GIS data in the project backlog using newly developed processes, templates and tools
- Working with stakeholders of downstream systems to determine data requirements for the GIS and CMMS
- Development of processes, templates and tools for storing this data in alignment with the GIS and CMMS plan
- Entry of all GIS and asset data gathered in the line and pole assessment programs into the GIS and CMMS using these new processes, templates and tools
- Upgrade the fleet management system to vendor supported level and then enable additional capabilities within the solution

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer**	☒ Deliver a Positive Customer Experience	Indirect

Asset Data Integrity

Primary Goals	Objectives	Direct or Indirect Impact
Satisfaction	☒ Increase Service Reliability	Indirect
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

This program directly promotes a safe workplace through the accurate representation of T&D System elements and their locations.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Since up-to-date GIS data is a key input to public-facing applications, this helps ensure a more transparent outlook to the public. Additionally, better GIS data enables employees to respond more quickly to requirements, thereby improving service and, as a result, the customer experience.

Objective: Increase Service Reliability

This program improves service reliability by accurately identifying assets that serve customers, thereby speeding up the service restoration process.

Asset Data Integrity

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Accurate GIS data results in accurate system representations in the EMS, the OMS, the ADMS, (as planned for the future) and system planning models designed to improve the operation, service restoration, maintenance and planning processes. It also directly enhances operational excellence by allowing operations to be executed systematically.

Accurate CMMS data allows for systematic management of assets.

Objective: Pursue Project Delivery Excellence

Project delivery excellence is also enhanced because having accurate data is key to ensuring that projects consider all relevant factors during planning and design. Asset data is a key input into various analytics and reports that support business decisions.

Objective: Enable Employees to Execute Operations Systematically

The GIS connectivity model is a key input into employee applications, such as an up-to-date outage map. As such, this allows employees to execute operations more systematically.

2.6 Program Risks

The main risk to not completing accurate and flexible GIS and CMMS systems is that lack of data negatively impacts the planning, operation, maintenance and service restoration processes of the whole T&D System, which affects overall reliability of the T&D System. Not implementing GIS and CMMS standards and data verification impacts multiple other programs which may not function correctly without GIS data.

Without this program, assets will continue to be maintained in an ad hoc and manual manner, limiting LUMA's ability to monitor, maintain, and replace assets prudently and efficiently. These manual processes will negatively affect performance levels and increase the risk of human error. This will directly affect LUMA's reputation in the marketplace through an inability to respond to customer requests in a timely and appropriate manner.

A secondary risk is that the continued use of non-supported software and methods increases vulnerability to security breaches and prolonged system outages.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$4.9**	**$3.3**	**$3.3**	**$8.4**
SRP Expenditures	$2.4	$2.4	$2.4	$0.9

Asset Data Integrity

3.2 Program Resource Requirements

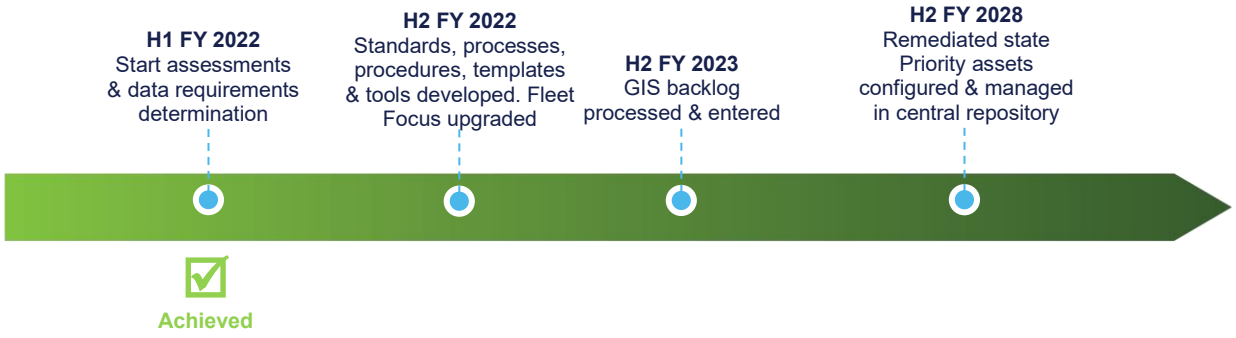
- 22 full-time employees to identify GIS data requirements and complete data collection, validation and entry.
- Four full-time employees additional in year 1 to perform critical prerequisite activities, such as developing standards, processes, tools, training, etc.
- Six full-time employees ongoing for T&D System operation and maintenance (one senior and one junior in the first year then adding a junior for each year after up to five juniors in total).
- Asset management solution system integrator.
- Asset management solution software licensing.
- Additional sufficient resources to complete non-SRP projects.
- Continued IT/OT lifecycle funding (beyond what is included in the funding table above) to upgrade / replace systems as they come to end of life.

3.3 Estimating Methods & Assumptions

Estimates were based on SRP items and key prerequisites in starting years. Because of a lack of existing data, these estimates are subject to change as data is collected and recorded.

- The overall assumption is one hour per structure for recording all asset data, including third-party information.
- The total of 725,000 structures is assumed from a previous GIS report, and includes stand-alone streetlights, as well as transmission and distribution structures.
- Additional time is assumed in the first year to do critical activities, such as developing standards, processes, tools, training, etc.
- Field data collection costs were based on other projects.
- The costs associated with the implementation of asset management and work order management processes and tools is estimated using the International Business Machine (IBM) Project Cost Estimator for implementing a Gartner-recognized industry leading ITSM solution. Pricing assumptions are based on the implementation of AssetSuite for a medium-large sized enterprise as this solution is currently implemented at PREPA to support generation asset and work order management.

3.4 SRP Program Timeline & Milestones



Permit Processes & Management

1.0 Program Description

LUMA will introduce new systems for managing operational permits to enable the system to comply with permit obligations and to provide support for federal funding requirements. The program will develop new procedures so that responsible parties have the tools to meet permit obligations and identify additional necessary permits, along with introducing training programs to allow those procedures to be implemented effectively. As part of this program, LUMA will continue to engage with government agencies to adhere to any adjusting permitting procedures or requirements to be implemented.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Compliance with permit obligations for operational permits is required and currently may not be consistently met. A centralized permit system for the LUMA organization will allow for more consistency and standardization of practices.

LUMA's gap assessment has shown that:

- There does not appear to be a quality management system in effect.
- There is a reliance on worker experience in performing tasks and there are no documented systems or procedures in place.
- Job procedures and training programs are lacking.
- The documentation of work completed is not sufficient to demonstrate compliance with permit obligations. LUMA needs to mitigate the risk of noncompliance with requirements, which could result in fines, potential work interruptions and other adverse impacts.

2.1.1 Additional Gaps Identified Post-Commencement

- Lack of processes for permit applications and compliance management relating to Construction Projects and/or system improvements.
- A lack of understanding regarding permit requirements for Federal regulation.

2.2 Description of Remediated State

According to the Act 17, Article 1.5(6)(a) and Article 1.10(g) of the T&D OMA, establishes as public policy that LUMA is required to be in compliance with applicable environmental laws and regulations.

According to Section 5.6 (b) of the T&D OMA, LUMA is required to make all filings and applications and submit all reports necessary to obtain and maintain all Governmental Approvals in the name of PREPA, or if required by Applicable Law. In addition, LUMA must:

- Prepare the application and develop and furnish all necessary supporting material, data and information that may be required.
  - Familiarize itself with the terms and conditions of such Governmental Approvals.
  - Attend all meetings and hearings required to obtain such approvals; and

- Take all other action necessary or otherwise reasonably requested by the P3 Authority in order to assist and support PREPA in obtaining, maintaining, renewing, extending, and complying, as may be relevant, with the terms of such Governmental Approvals.

Finally, according to the Annex I, Section I(G)(2) of the T&D OMA, LUMA is responsible for environmental compliance, maintenance of documentation and acquisition of permitting required for T&D operations.

As defined in the above conditions and under the T&D OMA, in the remediated state, LUMA will have a system in place to obtain required permits to operate in compliance with the law. Areas of noncompliance will have been identified, with a remediation plan underway to solve critical issues in a timely manner.

A basic understanding of the permitting requirements will have been established in the organization. Training programs to improve work practices will be in development, but implementation of such training programs will not yet have fully occurred.

2.3 Description of Program Completed State

At program completion, the organization will have implemented a quality management system, developed job procedures, and completed training programs related to obtaining and managing permits. This will ensure work is completed in compliance with permit obligations and that consistent documentation of such work can prove this compliance. Ongoing activities include ensuring that the permits are obtained, renewed, and amended on time, ensuring that associated reporting to regulators is made on time, and ensuring that activities covered under the permits (e.g., construction, vegetation management, etc.) are carried out in accordance with the permit requirements, and other permit requirements are met, to minimize noncompliance.

2.4 Program Activities

- Obtaining, maintaining, renewing, extending, and complying with necessary permits as quickly as possible, including maintaining a full list of operational permits.
- Defining of obligations for operations to meet permit compliance and full requirements to obtain new permits.
- Continuing engagement with government agencies to adhere to operator permitting procedures and requirements implemented post commencement.
- Evaluating current facilities and operational practices to ascertain new additional necessary permits. in obtaining, maintaining, renewing, extending, and complying with permit requirements.
- Establishing basic operational performance levels relative to required standards as quickly as possible.
- Documentation of procedures and distribution to work groups.
- Developing training programs.
- Establishment of a quality management system.
- Development of job procedures and training programs in accordance with the guidelines of the quality management system and as necessary to address work practices required to demonstrate compliance
- Implementation of a records system such that documentation of work completed will demonstrate compliance with requirements.

Permit Processes & Management

2.4.1 Additional Activities Identified Post-Commencement

Establish permit applications for all necessary permit requirements and conditions for construction permits and system improvements.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Development of a quality management system supported by work procedures is integral to a safe workplace. Such a system forms the foundation of a safety program.

Objective: Implement Effective Public Safety Practices

More consistency of permit practices will improve the quality of related work, thereby improving public safety for any installation.

Permit Processes & Management

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Strict compliance with permit obligations will reflect positively upon the company with the agency issuing a permit.

Objective: Increase Service Reliability

Improved work practices will lead to a superior quality product or installation, thereby improving the reliability of the system.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

The quality management system, as supported by detailed work procedures, form a foundation for systematic management of the business. This system is also essential to the pursuit of project delivery excellence as these measures provide the baseline from which to evaluate the performance of work. The quality management system will also enable employees to consistently complete work to the necessary standards while complying with permit obligations.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Proof of compliance with permit obligations will contribute to evidence that requirements for federal funding have been met.

2.6 Program Risks

The risk in not proceeding with the program is to continue with the present system, which is inadequate. The present system does not meet compliance requirements and generates noncompliance fees. Current practices are insufficient to meet contractual requirements for operation of the system. Current methodologies could put contractual arrangements at risk and could result in a loss of federal funding due to the inability to demonstrate compliance with permit obligations. Without this program, LUMA runs the risk of being in violation of permits and not maintaining awareness of ongoing changes to permitting requirements, which could result in further fines, potential work interruptions and other adverse impacts.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$2.2**	**$2.4**	**—**	**—**
SRP Expenditures	$0.5	$0.5	—	—

3.2 Program Resource Requirements

The permits program will require IT support for the records system.

Permit Processes & Management

Legal resources will be required to obtain permits and to determine the obligations under the different permits.

The Permit Processes & Management Program will require a contractor to help write the procedures and schedule the training.

The Permit Processes & Management Program will require a contractor and HR support to develop the training programs.

3.3 Estimating Methods & Assumptions

LUMA pay scales have been assumed for internal employee resources.

Previous rates for external contractors have been assumed.

APPLICABLE STANDARDS & CODES

Federal legislation, local legislation, industry best practices, international and local codes.

SUPPORT FROM SCHEDULING & ESTIMATING

Operational permits will require scheduling support to complete and file reports, renew existing permits and complete applications for permits. Different fees are associated with each of the permits. In the case of noncompliance with permit obligations fees may be payable. Estimating fees in this case will also be required.

3.4 SRP Program Timeline and Milestones



Workflow Processes & Tracking

1.0 Program Description

This program includes several initiatives that address gaps between current state and standard industry methods, practices, and processes to manage, track, and report progress on the performance of field work. Specific areas include:

- Establishing proper and safe maintenance regimens (preventive, planned and unplanned corrective, and emergency repairs)
- Adhering to design, maintenance and construction standards
- Implementing proper inspection and testing procedures
- Implementing KPI / metric performance management with a focus on measuring and driving improvements in work quality, effectiveness and efficiency
- Implementing technologies to reduce cycle time in identifying and remediating any performance anomalies while concurrently supporting the Asset Management function

2.0 Program Rationale

2.1 Initial State & Identified Gaps

The Workflow Process and Tracking Program is intended to improve the performance of the critical T&D assets and approximately 2,000 employees assigned to T&D Operations[1]. More specifically, it is targeted at addressing those workflow related gaps that are required to address deficiencies noted in the recently conducted gap assessment, namely:

Work Planning and Execution with 21 gaps, summarized as follows:

- Work is largely reactive, overriding any attempt to implement a properly prioritized work plan
- Virtually no preventive maintenance is performed, resulting in a “run-to-failure” mode of operation and subsequent focus on emergency maintenance
- Lacking a strong work planning and scheduling cadence that “protects the schedule” on a daily / weekly basis
- Current systems are not able to address the requirements of an effective work management program
- Inability to accurately measure / implement initiatives to improve worker productivity
- Outside contracting lacks clarity in scope and any semblance of quality assurance
- Significant shortfalls with respect to public and employee safety. Field lacks appropriate communications and reporting tools: Laptops, cell phones (including data plans), mobile data collection devices, radios, satellite phones, and vehicle Global Positioning System (GPS) for visibility

Technical Services with 11 gaps, summarized as follows:

- Absence or ignorance of well-documented lockout / tagout procedures and protocols

[1] Note that similar challenges, prevalent in Fleet and Materials Management / Warehousing, are addressed within other Programs.

- Inconsistent approach to training, largely on the job, dependent of the expertise and priorities of each supervisor
- Lack of mapping documents / single-line diagrams to facilitate the work

Reliability (Service Restoration) with 21 Gaps, summarized as the follows:

- Repairs be they partial, provisional, or permanent, are rarely revisited post-outage
- Line crew staffing is rigid in terms of size (typically 4-person crews independent of the task) and location (strong regional focus)
- 24/7 coverage applies in only two of the seven regions
- There is a general lack of technology, both at the system level to restore service more rapidly to large pockets of customers, and the administrative / managerial level to expedite the processing of damage assessments from initial review to final closeout of repairs
- Restoration process is not substantiated with formal operating procedures and checklists

System Performance Management with 6 Gaps, summarized as follows:

- Unavailability of complete and accurate data in key performance domains and limited capability to perform advanced analytics
- To the extent that corrective action plans are implemented, there is a high dependence on intuition and gut feel in choosing among options
- Skepticism regarding PREPA's willingness to take decisive action should an analysis of data indicate a clear performance improvement opportunity

These gaps combined with a general lack of technology enablement noted above has several implications:

- Work requests are delayed weeks or months before finally making their way to field personnel to complete the work
- Missing, inaccurate or out-of-date records creates gaps regarding the state of system, impacting worker productivity at the least with a high likelihood of creating an unsafe environment for the public and employees
- Undocumented or inconsistently applied work methods result in varying levels of quality and completeness and potentially create unsafe working conditions
- An antiquated work management system (no longer vendor supported) creates the need for workarounds and provides on partial automation in the generation of work orders and performance reporting

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of the Remediated State

In the remediated state, compliance with the relevant articles of Act 17 and Act 57, and the T&D OMA provisions specified in Contract Standards, Annex I will require that:

- A work planning and execution process and tracking system is in place, driving the use of scheduling to align the organization around the performance of work

- Procedures and training exist to address the safety deficiencies identified in the review of Distribution Operations, contingent measures are in place to offset the effects of outdated and inaccurate documentation, and a plan is developed and underway to produce a more permanent solution
- A quality management system is in place to ensure compliance with applicable regulations or standards: Inspection and Test Plans (ITPs) have been created and quality control documentation has been developed for critical T&D assets, with full compliance to quality control / quality assurance requirements
- Preventive maintenance programs are established for all critical substation, transmission and distribution line, fleet and material handling assets, and T&D Operations achieves an overall 75 percent completion rate
- Systems and processes are in place to track, monitor and report test and inspection completion rates for those activities required by the above listed regulations and standards
- Sufficient communications and reporting tools (e.g., laptops, cell phones (including data plans), mobile data collection devices, radios, satellite phones, and vehicle GPS) be purchased and distributed to assure worker safety

2.3 Description of Program Completed State

In the completed state, interval preventative maintenance plans will be scheduled and executed on a regular basis. The implementation of regular preventative maintenance will help to steer the organization from a predominantly reactive approach to one that operates in a more planned fashion.

Concurrently, more formalized work management processes and procedures will ensure resources are dispatched in an organized, prioritized and planned approach, focused on regulatory and legal compliance while providing safe and reliable electric service to all customers. Employees will be equipped with systems and processes to work across the system both efficiently and safely in accordance with LUMA work methods. Completed work will be performed to the correct standards and specifications, as monitored and guaranteed by the implemented quality program, ensuring that the system is built and operated as designed and intended.

The above systems and processes will be the norm rather than the exception, and minimal oversight and enforcement will be required to achieve compliance with targeted outcomes.

2.4 Program Activities

WORK METHODS

- Define a template and list of required work methods across Operations
- Develop all the required work methods in English and Spanish
- Implement a work method electronic document storage solution, likely on existing document management software or procure software
- Develop site training material for critical work methods, likely through a third-party vendor
- Perform training on work methods for all employees in Operations

PROCESS, PRACTICES, DOCUMENTATION & PROCEDURES — QUALITY

- Define ITP template and master list of all required ITPs within Operations
- Implement a document storage solution, management process and supporting software, likely through the procurement of a commercially available software solution

- Identify and develop procedures and processes required to address potential safety gaps and conduct training, as appropriate to ensure proper implementation
- Address out-of-date and inaccessible drawings and related documentation

PREVENTATIVE MAINTENANCE

- Develop the preventative maintenance program and procedures
- Procure or develop a software solution to manage the preventative maintenance schedule, maintenance records and documentation
- Develop and roll out user training on how to follow the program and use the software

PRODUCTIVITY TRACKING

- Develop a consistent work management and dispatch system by improving functionality in existing systems (OMS, in-service, Storms, iNET, etc.) or procuring a new software solution
- Develop and roll out training on the new software and processes
- Define and implement scheduling protocols and regimens to drive organizational alignment around the performance of work
- Develop KPIs / metrics and reporting regimen to increase transparency of worker productivity and resulting system performance

GENERAL TECHNOLOGY WORKFORCE MANAGEMENT

- Define business requirements and assess available software solutions against business requirements, technical fit and cost
- Define work priorities and associated competencies for the tool
- Adopt core configuration of selected product
- Perform initial implementation of workforce management solution (18 months) and establish competencies for performing transmission, distribution, and substation work
- Purchase and distribute balance of communications and reporting tools (e.g., laptops, cell phones [including data plans], mobile data collection devices, radios, satellite phones, and vehicle GPS) to support worker productivity

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Indirect
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect

Workflow Processes & Tracking

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☒ Restore Damaged Grid Infrastructure	Indirect
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

This program will reduce the risk of incidents and fatalities in the performance of work by building work plans that are interwoven with LUMA's emphasis on safety (including proper use of PPE), limiting injuries and avoiding fatalities. With respect to fleet and materials handling, well-planned work, planned and executed in accordance with applicable laws and regulations is analogous to these considerations for safety.

Objective: Implement Effective Public Safety Practices

Overall improved work methods and quality will create a better constructed and maintained system, which contributes to overall public safety. In essence, the public will be safer because the overall system operates as intended and any maintenance is planned to account for any interface with other facilities and the public at large.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Increase Service Reliability
Objective: Deliver Electricity at Reasonable Prices

A well-orchestrated work management process will alleviate several sources of customer-related issues: third-party damage, unplanned intrusions onto a customer's property, and rework resulting from poor quality. Better maintained assets, including those that support fieldwork (e.g., fleet), and improved work

planning and execution translate directly to shorter, less costly outages and an overall improved customer experience.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

Software solutions will support a more systematic approach to work management, thus improving quality, shifting the emphasis from reactive corrective maintenance to better planned preventive maintenance, and enabling the tracking of and resulting improvements in productivity.

Clarity of expectations with respect to work methods and mandatory standards, all part of an effective work management process, inevitably leads to improved productivity. Improved work planning leads directly to availability of equipment and tools (including less downtime on material and fleet), thus improving efficiency / increasing effectiveness of field personnel in the normal performance of work. In doing so, the organization is also better able to respond to emergencies (including system outages), with reduced reliance on overtime.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding
Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

Work methods, vehicles and equipment will be used to complete FEMA work more safely and efficiently, one of the outcomes of which is improved outage response and system restoration timelines.

Efficient deployment of the workforce will result in improved worker productivity, leading to better use of federal funding (i.e., increased productivity).

Control of the workforce and efficient dispatch of available resources will assist LUMA in responding to outages quicker, thus reducing the time required to restore damaged infrastructure and, as a result, service (as measured by SAIDI or CAIDI).

In the event of an emergency, disaster or catastrophic event, control of the workforce (planning and dispatch) and proper fleet and equipment (the result of effective preventative and corrective maintenance practices and enabling software), will aid LUMA employees in being better prepared to respond to outages and effect repairs to restore power quicker than previously experienced. Adherence to consistent quality standards, part and parcel to a more robust work management process and system, is consistent with and a prerequisite to LUMA's objective for a more resilient grid.

2.6 Program Risks

There is a substantial downside risk in failing to pursue this program. Without it, employees will not have established work methods, quality standards, safe vehicles and equipment, or coordinated dispatch to safely operate and maintain the electrical system as a prudent utility. Workforce management will continue to be managed in an ad hoc and inconsistent manner limiting LUMA's ability to actively manage the maintenance and replacement of assets. Manual processes are too cumbersome to consistently identify and trend performance. As such, risks of not pursuing this program include issues related to the

realities of human error, possible degradation of LUMA's reputation (particularly if deemed out-of-compliance with applicable laws and regulations), difficulties in meeting customer service expectations (during "blue sky" or major storm events) and higher than acceptable T&D O&M costs.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$1.3**	**$0.6**	**$10.0**	**$25.9**
SRP Expenditures	$1.2	$0.5	—	—

3.2 Program Resource Requirements

Several people will be required from within the Operations department to carry out the implementation of these improvements, as well as support from IT/OT, HR and Utility Transformation.

3.3 Estimating Methods & Assumptions

Applicable Standards and Codes considered included:

- OSHA
- IEEE
- LUMA's safety practices, programs, work methods
- Prudent Utility Industry standards
- Labor law
- Puerto Rico law
- Manufacturer recommendations

We assumed an in-service date of two months from commencement, followed by prioritized spend over the balance of the calendar year, and then annually at the beginning of the fiscal year.

Applicable program standards and requirements included:

- LUMA's safety management systems and standards
- LUMA's work methods
- LUMA's training programs
- LUMA's engineering and design specifications and standards
- LUMA's system operations, switching and outage guidelines
- LUMA's Operations department standard operating procedures manual

Assumptions on contract or internal resources:

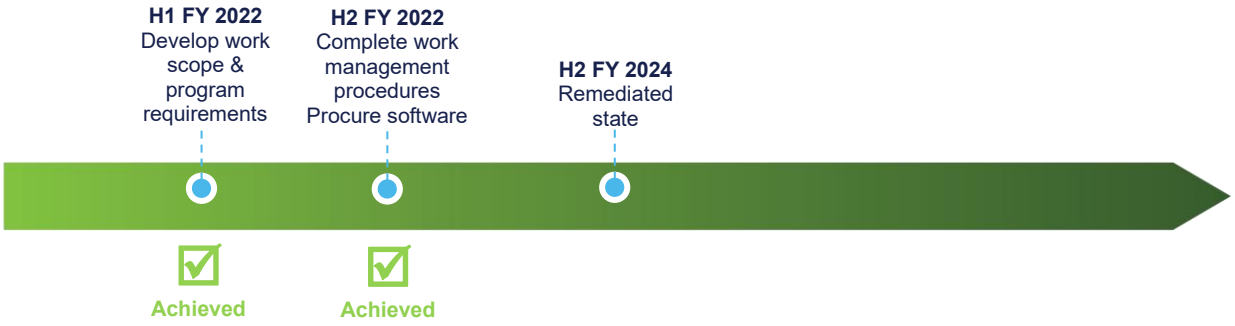
- Approximately 1,000 field / technical employees
- 800 fleet and equipment assets to be incorporated into the maintenance programs

Workflow Processes & Tracking

- Executive and senior management staff, dozens of supervisors and over approximately 1000 technical employees who will require training on dispatch and the work management system, any new work methods and LUMA's quality and preventative maintenance programs

Historical program information is based on the following systems: STORMS, OMS and iDispatcher, iNet and existing customer care and billing software.

3.4 SRP Program Timeline & Milestones



Materials Management

1.0 Program Description

This program covers all aspects of materials management and includes management of:

- Asset recovery
- Oil containment
- Inventory management
- Asset suite reconfiguration
- Demand training
- Implementation and measurement of KPIs related to materials
- Capital plans for material handling and warehousing storage and facility improvements
- Logistics function and related equipment
- Material evaluation and disposition

2.0 Program Rationale

2.1 Current State & Identified Gaps

PREPA manages a warehousing network consisting of one central distribution center, six regional, and 16 district warehouses to support T&D operations across the island. They also manage four warehouses that support generation plants located in Costa Sur, Aguirre, central San Juan, and Palo Seco. Their inventory distribution uses a hub and spoke model, essentially a decentralized approach. They manage their own transportation fleet and distribute their own internal/external mail.

Looking across the entire Materials Management function, significant deficiencies were identified during the gap assessment:

- PREPA lacks the critical experience, tools, equipment, and infrastructure to serve operations adequately, efficiently, and safely.
- The organization lacks the processes, programs, procedures, structure, and assets to adequately serve the operational materials management needs of the transmission, distribution and generation systems.
- There is a visible lack of support from the executive level of the organization to make improvements.
- Each region of the organization operates in a siloed manner leading to disparities in how company resources are managed across Puerto Rico.
- There are no standardized training programs, and formal documented processes are generally not available or have not been effectively implemented across the organization.
- Existing facilities, material and equipment are significantly damaged from the hurricanes or well past usable life, creating unsafe working conditions.
- There is an overwhelming amount of surplus and scrap material as well as general garbage/debris in every facility.
- Safety is not embedded in the responsibilities of each employee and part of their working environment.

Materials Management

- Warehousing storage equipment is not properly installed, labeled, or supporting safe operating conditions.

Examining each of the four functional areas that define Materials Management, the following gaps substantiate our overall view that standardized and formal inventory management, asset recovery, warehousing, and logistics functions do not currently exist at PREPA:

INVENTORY MANAGEMENT

- Current inventory management practices tend to be sub-optimal
- Lack of forecasting/integration with upstream demand
- Inventory balance does not accurately reflect usable physical inventory
- Inventory controls do not conform with industry best practice
- Critical spares do not exist
- Inventory management decisions/strategy are made informally and can be influenced by political considerations
- Long-term supply agreements/relationships are non-existent, leading to spot procurement for all material purchases
- Material is purchased at Delivered Duty Paid without sufficient regard to the cost of material vs. freight and any other hidden costs
- Material lifecycle is not a consideration in standards/procurement decisions
- Puerto Rico wide material strategy/control is lacking, without clear strategies and direction across the warehouse network since inventory standards are separately managed at each location
- KPIs have not been developed
- There is a large volume of non-standard material that is spread across Puerto Rico

ASSET RECOVERY

- Surplus material is not returned to inventory, remains with Operations personnel. This leads to non-standard material being used in the field, lack of inventory control, inaccurate material forecasting and demand management.
- Scrap/salvage/recyclable/garbage is managed with a fragmented approach. There is no contract management function to address performance deficiencies, reconcile invoices, perform audits, etc.
- The approach to salvaged/burnout oil-filled equipment does not comply with Federal/Commonwealth regulations and in some cases will require a significant and costly cleanup effort to remediate.
- There is a significant amount of salvage/scrap/garbage/debris in most facilities and yards that presents, at best, an extremely negative view to the public, at worst, a safety and environmental hazard.
- PREPA lacks the equipment and material to manage the waste stream: mobile and stationary secondary containment, crates, bins, etc.
- PREPA lacks the knowledge, training, and experience to manage the waste stream.

WAREHOUSING

- The existing facilities and equipment are aged, damaged, and largely inadequate for the needs in most sites. Significant damage from Hurricane Maria and the earthquake still exists at some facilities rendering them:
  - Unusable

  - Usable, but causing damage to material and infrastructure due to rain/flooding and introducing safety hazards into daily operations
- There are no existing standards for storage of goods by category (such as cable reels, copper, transformers, etc.). This presents a safety hazard and leads to wasted material due to physical/environmental damage (rust/rot). As a result, storage equipment/infrastructure varies by location and is insufficient for safekeeping of the material in most locations.
- Storage equipment is either unavailable, improperly installed, or improperly used, leading to safety hazards and process inefficiencies.
- Processes are poorly defined and not implemented across the organization.
- Standardized training programs are not in place (e.g., for forklift/transportation of dangerous goods, etc.). The same applies to specialized training needs (e.g., for lifting, rigging or tele-handling).

LOGISTICS

- The existing transportation equipment is aged/damaged and doesn't comply with Department of Transportation (DOT) regulations. Most transportation equipment would not be considered "road-worthy" by North American standards, and some present a serious safety risk to both PREPA personnel and the public.
- There is no dispatch or management for transportation of materials or other freight, leading to poor utilization of resources across the island.
- Both standardized (e.g., safety, forklift, and transportation of dangerous goods) and specialized (e.g., load securement, rigging and lifting) training programs are not in place.
- Formalized documentation procedures are not in place (e.g., pre-trip inspections, bills of lading, packing slips, trip logs, etc.).

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

- In the remediated state, LUMA's material management capability will:
  - Meet the daily operational requirements of the organization in steady state and emergency operations, complying with local, state, and federal regulations (DOT/ Federal Motor Carrier Safety Administration (FMCSA) and OSHA/ANSI, particularly the applicable parts and section of CFR 49 and CFR 27).
  - Have safety embedded in the organizations operating procedures and have most of the equipment required to support a safe working environment.
  - Have facilities that adequately and safely support the needs of the organization.
  - Carry an inventory of material that is ordered, processed, stored, and delivered in safe and efficient manners.
  - Utilize existing systems and controls to support accurate transaction of data, complying with internal and external policies and regulations.
  - Manage material salvage/scrap/return in a process that complies with local and federal regulations.
  - Have a management and training program regarding oil-filled equipment management and spill containment in place per environmental requirements. Minimum required equipment and structures will be in place and regularly used and maintained. Contracts for equipment repair, refurbishment, disposal will be in use.

Materials Management

2.3 Description of Program Completed State

In the completed state, LUMA's material management capability will:

- Contribute toward an efficient, professional, and safe organization that fully complies with all local, state, and federal laws and regulations.
- Exceed the service requirements of the organization in steady state or emergency operations while remaining fully compliant with all local, state, and federal laws and regulations.
- Be lean, agile, accurate, and able to meet the forthcoming changes required in order to meet Law 17 Renewable Energy targets.
- Have safety embedded in the organizations operating procedures and have all equipment supporting/enhancing a safe working environment.
- Have facilities that adequately support the needs of the organization, are hurricane ready and are scalable to future demands.
- Have the systems and controls in place that support efficient and accurate transaction of data, as well as compliance with all internal and external polices and regulations.
- Collect data on all key processes, monitoring, reporting, and increasing performance through continuous improvement initiatives.
- Carry the optimum amount of Inventory that is ordered, processed, stored, and delivered with care and attention, maximizing organizational investment while adhering to all specifications and quality requirements.
- Manage material salvage/scrap/return in a process that is efficient and environmentally and fiscally responsible and complies with local and federal regulations.
- Fully manage the transportation of all organizational freight from point of shipment to final site receipt, maintaining visibility and control through all carriers and transportation modes.
- Have a culture of responsibility and an institutional knowledge regarding oil-filled equipment management and spill containment. All relevant equipment and structures will be in place and regularly used/maintained. Effective contracts for equipment repair, refurbishment, disposal will be in place.

2.4 Program Activities

- Set up and implementation of Asset Recovery function –
  - Development and implementation of processes and facilities for a fully functioning Asset Recovery department – Salvage/scrap/return of materials, training for warehousing and field construction personnel.
- Implementation of Warehouse Oil-Filled Equipment and Oil Containment Management Program –
  - Procurement of spill cleanup/containment equipment and oil containment structures where required.
  - Development and implementation of training program for all personnel handling or transporting oil-filled equipment, responsible for cleanup of spills and spill reporting.
  - Program will include examination of and potential retendering of existing agreements to obtain best service and value.
  - Engagement of ATCO / Quanta knowledge and expertise as required to determine best path forward for construction/implementation of mitigation measures.
- Asset Suite Reconfiguration Assessment –
  - Procurement of services to assess existing utilization of asset suite inventory and recommend configuration changes to align with upcoming strategic plans for materials management and LUMA overall.

Materials Management

  - Addition of bar code scanners for warehouses coordinating with Asset Suite Inventory.
- Asset Suite Reconfiguration Execution –
  - Reconfiguration of asset suite to utilize all relevant features and maximize operational efficiency including bar code scanner technology.
  - Ensure segregation of duties issues are removed and minimum checks/balances are in place to maintain efficiency and protect LUMA.
- Planned Demand Training Program –
  - Development and implementation of processes for requisition and request of materials using asset suite - program includes process design, training package development, training of field engineering and construction personnel, training of field warehousing personnel, standardizing communication methods.
- KPI implementation and measurement –
  - Implementation of a program and associated processes, for regular measurement and reporting of KPIs and auditing of key processes.
- Material Handling Equipment Capital Plan –
  - Procurement of materials handling equipment to resolve deficiencies in existing equipment within the warehousing network - reach lifts at L1, L2 warehouses where applicable, indoor counterbalance forklift replacements, rough terrain forklifts at all warehouses handling poles.
- Warehousing Storage Equipment Capital Plan –
  - Procurement of materials storage equipment to resolve deficiencies within the warehousing network - heavy grade plastic pallets for all locations to replace wooden pallets, racking improvements (floor bolted bumper guards on all legs, weight ratings on all crossbeams, leg replacements, all legs bolted to the floor), pole bunks in all warehousing locations with poles, outdoor/indoor labeling for all stock items and indoor hazardous materials cabinets.
- Warehousing Facility Improvements Capital Plan –
  - Procurement of services to perform repairs/improvements to existing warehouse facilities and to erect covered storage and numerous locations that have deficient/damaged covered storage. Deficiencies include repairs to roofs, walls, overhead cranes, replacement of lighting, air conditioning units, installation of overhead fans or lighting.
  - New installation of covered storage to provide protection for material from the elements i.e., wood reels, transformers, crates of miscellaneous material. Installation of flood prevention measures at specific sites, loading docks at sites with high volumes of cube vans/highway vans.
  - Addition of WI-FI to all warehouse locations and amplifiers to insure full coverage of warehouse and yards.
- Logistics Equipment Capital Replacement Program –
  - Assessment and replacement of logistics equipment to align with LUMA logistics strategy. Examples of equipment to be procured: flat deck trailers, tractors with knuckle-boom pickers, cube vans.
- Logistics Function Implementation –
  - Procurement and implementation of a logistics management tool to receive requests, track and dispatch the fleet of logistics equipment.
  - Procurement and installation of GPS tracking units on all existing equipment to align with implementation of the tool.
- United State Army Corps of Engineers (USACE) Material Evaluation and Disposition –
  - Evaluation of USACE material across the Warehousing network for alignment for existing and future LUMA standards.
  - Evaluation of disposition and transportation to the Centers of Disease Control (CDC) as required for sale/salvage/remanufacture (transformers).

Materials Management

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☒ Restore Damaged Grid Infrastructure	Indirect
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

Standardized procedures for inventory management, asset recovery, etc. will help to ensure safe working practices across the organization, both for a safer workplace and better public safety practices.

Availability of equipment and tools ensure that work tasks can be performed effectively and efficiently, and with reduced safety risk.

Effective materials management and asset recovery processes support rapid restoration in case of a major event such as hurricane, thereby reducing safety impacts of power outages.

Materials Management

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability
Objective: Deliver Electricity at Reasonable Prices

Better processes for logistics, inventory management, asset recovery, etc. will help streamline internal operations, thus improving service reliability. These processes will also help to make spending on these areas more efficient, thus allowing for electricity to be delivered at more reasonable prices.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

Standardization of processes will help to systematize business operations, both for overall management, and as applied to how employees conduct themselves within functions under Materials Management. As a whole, this will help to improve major outage event readiness and emergency materials management, thus contributing to improved project delivery

Measurement of process efficiency will track progress to performance targets and identify gaps in process, fostering continuous improvement and improving project delivery.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

A robust Materials Management framework will ensure that all material purchases and deployment to federally funded projects will be at the lowest possible cost while maintaining quality and service, utilizing existing materials agreements established for regular operations requirements.

Objective: Restore Damaged Grid Infrastructure

The improvements in materials management supported under this program will help to restore damaged grid infrastructure by ensuring construction materials are available for use, follow specifications and quality requirements, and efficiently and effectively deployed to project sites.

2.6 Program Risks

Risks to delaying the program:

- Non-compliance with Federal and Commonwealth regulations (e.g., Occupational Health and Safety [OHS], DOT, EPA)
- Increased risk to employee safety in daily operations
- Risk to upcoming project demands on the Materials Management organization (unable to support increased workload, affecting project schedules/completion)
- Risk to meeting fiscal control metrics and external audits: no visibility of spend, material requirements within the organization, lack of material accuracy (write-offs)
- Lack of readiness for Major Outage Events

Risks related to commencement and execution:

Materials Management

- Non-compliance with Federal and Commonwealth regulations (e.g., OHS, DOT, EPA)
- Safety risks exist for employees and the public
- Material availability for projects
- Material adherence to newly implemented design standards
- Lack of relationships with suppliers (supply agreements)
- Sub-standard service contractors on-island within certain categories

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$1.0**	**$5.0**	**$5.4**	**$11.7**
SRP Expenditures	$0.7	$2.6	—	—

3.2 Program Resource Requirements

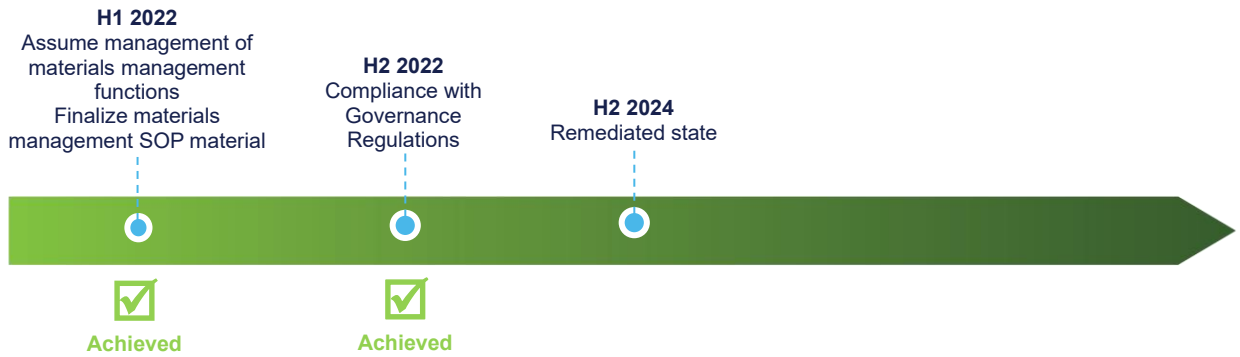
A number of people will be required from within the Operations department to carry out the implementation of these improvements, as well as support from IT/OT, HR and Utility Transformation.

3.3 Estimating Methods & Assumptions

Estimating methods/assumptions (estimating template available if required):

- Assumed loaded hourly rates x full-time employees per activity
- Researched materials & equipment costs (market quotes)
- Historical information from ATCO program

3.4 SRP Program Timeline & Milestones



Project Management Software & Tools

1.0 Program Description

LUMA will introduce new specialized project management, schedule management and project analysis software to ensure efficient execution of capital projects. This includes setup of an IT-based project, program and schedule management tool, a cost management and project analysis/reporting tool, a tool for workforce planning, scheduling, resource leveling and resource management and a tool to develop, manage and control PMO processes and flowcharts.

2.0 Program Rationale

2.1 Current State & Identified Gaps

For project scheduling and cost monitoring, the PREPA PMO currently uses Excel spreadsheets. This process is as such very basic, with an inadequate tool to conduct project management or construction management work.

The current excel tool used by the PREPA PMO would be unable to manage the large-scale project management work, construction, and commissioning functions of the large-scale capital program outlay for upgrade of the T&D infrastructure.

NEED/ISSUE

Most major utilities follow PMI standards. An IT-based project management tool is standard practice for establishing schedule-based WBSs, developing project schedules, monitoring schedules and evaluating and forecasting project progress.

This tool is also used for earned value management and analysis. This is done by establishing a Cost Breakdown Structure (CBS), establishing a cost baseline, and then tracking and evaluating the progress of the project. This allows monitoring of how well a project's actual expenditure is following its budget. The tool can evaluate corrective actions required for the project schedule and tasks budget in order to adhere to the project plan as closely as possible.

Project management IT tools (e.g., MS Project/Primavera P6, Unifier/Power BI) are invaluable as well as being industry standard practice. Such tools are critical to manage large and complex capital projects programs of the type and scale that LUMA will be handling.

MAJOR GAPS

- The PREPA PMO uses Excel for project scheduling and management, which is poorly equipped to manage large and complex capital programs.
- The PREPA PMO has not developed any WBS and does not have any of the appropriate IT tools to develop this for project scheduling.
- PREPA PMO does not prepare cost and schedule baselines (integral parts of industry-standard project plans) against which project progress can be monitored and controlled. This can be easily done with IT-based specialized project management tools rather than a general tool like Excel.
- PREPA PMO does not have schedule controllers, which implies the need for scheduling tools such as MS Project or Primavera P6 was missed.

- Under the current PREPA PMO process, the project manager uses Excel to develop rudimentary schedules and track progress manually. This method of scheduling and tracking is too cumbersome for large-scale projects and program management, for which dedicated schedulers are needed.
- PREPA PMO does not use any project management analysis IT software tools; for example, Power BI, or Unifier, which are used to generate project analysis, project key performance indicator dashboard and document current project status and forecasts.
- PREPA PMO currently uses an Excel based (cut-and-paste type) dashboard for project reports. These reports only compare actuals vs budget and do not provide detailed forecast analysis, future costs, productivity calculations and efficiencies.
- PREPA PMO does not use earned value analysis (EVA) for managing their projects.
- There are no internal IT based tools for workforce planning, scheduling or managing tools. Such tools would make it easier to assign internal resources based on resource availability graphs, resource scheduling and resource leveling.
- PREPA PMO does not have tools to develop, control and monitor PMO processes and flowcharts (for example, Visio or iGrafix).
- PREPA PMO does not use project KPIs, except for actuals vs budget, and spending on contractor resources. They do not have a tool to collect data on project progress which could be used to develop and analyze such KPIs.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the program completed state, LUMA would have completed the setup of:

- An IT based project, program and schedule management tool such as Microsoft Project (MS Project). MS Project is the leading industry-wide project and schedule management tools.
- A cost management and project analysis and reporting tool Microsoft Project's Power BI.
- A tool for workforce planning, scheduling, resource leveling and resource management to manage work and resources related to construction and commissioning.
- A tool to develop, manage and control PMO processes and flowcharts, e.g., Visio or iGrafix.
- A full PMO website and Document Control System that can be used by the Capital Programs department and all other LUMA departments to document and disseminate PMO processes, templates, forms, checklists, etc.

2.4 Program Activities

- Coordinate with end users (Capital Programs department) to ensure the needs of the software implementation have been met.
- Implement all required project management IT tools, including all required end to end testing.

2.4.1 Additional Activities Identified Post Commencement

No additional activities were identified at this time.

Project Management Software & Tools

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

The IT tools set up under this program will enable the Project Controls office to:

- Set project baselines
- Closely track and monitor the physical work progress and cost spend
- Ensure that projects come in on budget and systems are in place to track risks/issues and record variances/justifications

Objective: Pursue Project Delivery Excellence

The new tool will be used by the Project Controls office, which will be well staffed and equipped to manage the large number of projects that will be planned and executed every year. In this way, the project scheduling and cost control team will gain experience and skills.

Objective: Enable Employees to Execute Operations Systematically

Project Management Software & Tools

The IT software and tools will enable employees to take on more responsible tasks and improve their skills with systems and their levels of compliance with required procedures.

2.6 Program Risks

If the project management-related IT tools (MS Project) are missing or delayed there would be no tool to enable scheduling work, meaning that projects could not be effectively planned and executed by the Capital Programs department.

If there are no project management IT tools (e.g., MS Project, Power-BI) then baselines cannot be set, leading to an inability to monitor and evaluate the project progress against a baseline. This is particularly true for large and complex T&D projects crucial for the T&D infrastructure rebuild. Projects will run the risk of delays and budget overruns. The Capital Programs department would also not be able to provide proper reporting on project performance without the correct tools.

Similarly, individual program teams would not know how well their projects are progressing on time, budget and scope. Nor would they be able to effectively prescribe corrective actions if deviations from timelines, budget or scope are found.

In short, without these IT tools, project management activities would essentially be manual, much like the current PREPA PMO process, rendering it impossible to manage the capital programs that LUMA has committed to executing.

IT/OT department support for the execution of this program is critical and will be required. Delays in IT/OT support will delay standing up of all offices under the Capital Programs department, which in turn will affect project delivery.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.9**	—	—	—
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

- Support from LUMA IT/OT staff will be required to coordinate and manage.
- Capital Programs team members will be supporting the program as end users (indirect resources).
- Third party vendor who will provide the software tool, implementation, and training.

3.3 Estimating Methods & Assumptions

- Overall implementation is expected to be a minimum of 18 – 20 weeks, and any delays (e.g., in implementation of financial integration with MS Project-Power BI integration) will increase costs beyond what has been estimated.
- The cost of bringing in an external expert to develop IT SharePoint user site for PMO has been included.
- Office facility, IT hardware, furniture and associated expenses are not included in this estimate.

Operator Training

1.0 Program Description

This program will provide all necessary requirements to support new and existing system operator training along with operator competency assessments. As such, the program will address the need to improve current operator training and allow for new cohort(s) of operators to support the system. This will also improve operator response during an emergency situation.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

PREPA does not have enough operators, requiring some employees to perform 16 hour shifts for extended periods of time - potentially affecting their judgement due to accumulated fatigue. Further to this, some operators are eligible for retirement. Since it typically takes about 12-14 months to train an operator and since such trained personnel are not readily available in Puerto Rico, LUMA must develop a proper training program for onboarding operators as soon as possible. Further, competent operators are essential to ensure safe operation of the electric system and the utility reliability performance can be impacted. For all these reasons, the development of an operator training program is required as part of the SRP.

PREPA does not have a formal operator training program. Typically, training is performed through transmission of knowledge informally from experienced operators. This method typically takes about 4-6 months longer than a structured training program. Operators also do not have periodic competency assessments and “readiness” is determined on a judgement call from management. To compound this, operators do not practice on the system or conduct emergency drills to prepare for emergency weather events. PREPA does not have a system simulator for trainees and experienced operators to practice on.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps identified at this time.

2.2 Description of Remediated State

The program will follow the principles set forth in the T&D OMA and will be remediated when the first version of the training program is complete. This means the outline, the structure and the modules will have been defined, the content has been completed and the first cohort of new operators has been trained. It also means that a competency assessment matrix has been developed and made available.

Operator training currently underway and anticipated to reach remediated state by FY2023 Q2.

2.3 Description of Program Completed State

The program will have been completed when the first version of the operator training program is developed and a cohort of new operators has been trained, evaluated for competencies and made

Operator Training

available for deployment. Ideally the simulator will also be available to enable this training program. The drills and training protocols will have been completed and tested at least once.

2.4 Program Activities

Before making the simulator operational, a benefit/cost analysis will be performed before serious funds are committed. Depending on the availability of a simulator, an appropriate training program will be developed, which will be leveraged from industry standard practices that utilize current employees to document specific requirements.

The training program will be developed in parallel with the first cohort of new operator and adjusted based on the feedback and performance of the recruits.

Drills will be developed and tested in preparation for the hurricane season.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	

Operator Training

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Having competent operators will improve safety by reducing the risk of injury for field personnel in a hazardous situation involving live high voltage conductors or equipment at ground level.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Employees to Execute Operations Systematically

Well trained and competent employees will make better decisions and will be able to solve problems more effectively. This can also translate to faster service restoration.

2.6 Program Risks

The basic risks involved with delaying or not carrying out this program are related to system and people safety. Untrained or poorly trained operators are far more likely to make inappropriate decisions regarding operations, especially during high stress emergency conditions. Poorly trained operators, working long hours under normal circumstances, cannot be expected to make safe decisions in an emergency. This situation creates major liability exposure if training is neglected.

3.0 Program Funding & Timeline

3.1 Program Funding ($millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.0**	**—**	**—**	**—**
SRP Expenditures	$0.0	—	—	—

3.2 Program Resource Requirements

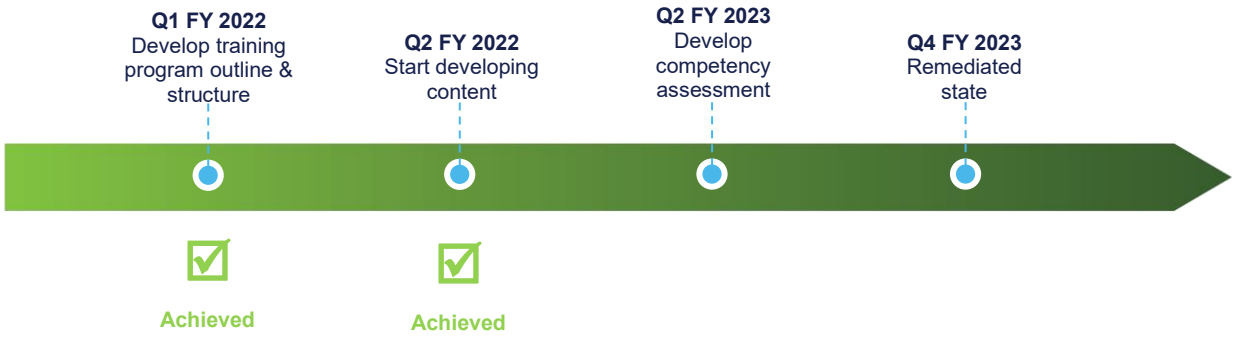
- A simulator consultant capable of making a benefit cost analysis
- LUMA employees to develop the training program

3.3 Estimating Methods & Assumptions

Program costs were estimated on a rate per hours basis. Hours were estimated based on the experience of subject matter experts. Costs will be reevaluated as part of a benefit/cost analysis for the simulator.

Operator Training

3.4 SRP Program Timeline & Milestones



Construction & Commissioning Management Office

1.0 Program Description

This program entails the setup of the Construction and Commissioning Management Office (CCMO) under LUMA's Capital Programs department. This office will be responsible for planning, managing, and controlling all construction and commissioning work using either LUMA internal resources or using external construction and commissioning contractors. The office will also be responsible for ensuring that all construction and commissioning work is completed on budget and on time as per the agreed scope.

2.0 Program Rationale

2.1 Current State & Identified Gaps

The PREPA PMO was formed in 2017 and is currently responsible for a wide range of projects including fiscal year planning, PPOAs, accounts, invoicing, procurement, and contracts. Additionally, it is responsible for project related functions of project execution, project control, stakeholder management and reporting. However, there is no team responsible for construction and commissioning management functions.

Because there is no team responsible for construction and commissioning management, the PREPA PMO supervises and executes construction and commissioning work entirely through external contractors. After awarding construction contracts to various contractors, the PREPA PMO also hires external sub-consultants/contractors to monitor and supervise the main construction contractor.

This current state is not able to efficiently manage the construction and commissioning functions for the large dollar/year capital program outlay for T&D infrastructure upgrades.

NEED/ISSUE

Most of the major utilities follow PMI standards. Under PMI standards, a separate office manages construction and commissioning functions within a utility. This office is responsible for:

- Establishing construction estimates
- Construction work plans
- Outage planning
- Construction management planning
- Managing construction and commissioning contractors
- Construction schedule monitoring and control
- Construction cost monitoring
- Monitoring construction risks and issues
- Ensuring contractor work complies with contract terms and conditions
- Managing the public interface with construction sites

- Liaising with the Risk Management office and project manager(s) on site-specific risks that may arise during construction
- Review of design drawings, proposal planning, construction estimates and bids for construction work
- Testing and activating all constructed assets to certify them as completed and operational

As discussed above, the CCMO ensures that project managers have all construction site data on an ongoing basis. This ensures that project managers have real-time information on the current state of construction activity and progress. The CCMO would also provide risk management data as it arises, along with advice on risk mitigation, which is jointly handled by the project manager and the Risk Management office (discussed in a separate program brief).

MAJOR GAPS

- A dedicated CCMO within the PREPA PMO is missing and is required to support all construction and commissioning related activities. The PREPA PMO has only two employees that track and monitor construction costs. They do so by using contractor invoices as they are submitted, with limited means to check progress on construction schedules, construction costs or forecasting in comparison with a construction baseline to determine that the project is on time and on budget.
- There are minimal construction and commissioning planning and management processes, procedures, templates, or checklists.
- PREPA monitors construction work by comparing contractor invoicing vs the approved PREPA budget. This does not meet the requirements of managing scope, cost, and time in an integrated fashion. This process also does not include reporting on progress of the physical works.
- There is no regular monitoring or proactive control of construction risks. The PREPA PMO does manage construction risks should they become issues. By this point, however, it is usually too late to employ effective mitigation.
- Estimating work specific to construction and commissioning is currently prepared by the PREPA project manager as there is no construction office support.
- There is no construction WBS within PREPA. Construction and commissioning work cannot be appropriately managed and controlled without a construction WBS.
- There is no workforce planning, scheduling, or tools management within PREPA. There are also no tools to track workforce labor efficiency and productivity. Such tools are needed to track and baseline construction work KPIs. There are also no construction work and labor productivity data to aid in parametric estimating.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the program completed state LUMA will have set up a well-organized CCMO within the Capital Programs department. It will be responsible for planning, managing, and controlling all construction and commissioning work through the use of either LUMA internal resources or using external construction and commissioning contractors. This office will be responsible for ensuring that all construction and

commissioning work is completed on budget, on time and as per agreed scope. For the new office to run well, LUMA will have developed all required construction and commissioning management plans, processes, procedures, templates, checklists etc.

This office will also set up to collect data on labor productivity, outputs, efficiencies, and unit rates to develop a better understanding of work outputs and process efficiency as it relates to construction works. This includes transforming the raw data into usable metrics such as output rate, burn rate, etc.

The CCMO will also engage in the design stage of all construction works, including review of design drawings, proposal planning, construction estimates and reviews and recommendations for construction bids. Prior to completion of any construction works, the CCMO will test and certify all assets as operational prior to transferring their oversight to the Operations department. Additionally, as risks arise on site, the CCMO will coordinate with the Risk Management office and project manager(s) to define appropriate mitigations and contingencies.

2.4 Program Activities (FY2023)

- Continue setting up CCMO responsible for managing the construction and commissioning activities on all projects.
- prepare detailed construction execution plans, construction management plans, processes and templates for transmission and distribution construction projects.
- plan and prepare construction related processes, procedures, flowcharts, templates, knowledge bases, etc.
- Prepare procedures for safe work practices, construction standards, quality assurance, and quality control of contractors work in accordance with contract specifications and Puerto Rico Safety Codes and Environmental codes, OSHA standards, etc.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct

Construction & Commissioning Management Office

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

The CCMO will have as part of its standard operating procedures processes that ensure the public are kept well informed of construction progress, costs, timelines, risks, delays, and any issues that arise.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

The new CCMO will be well staffed and equipped to manage the large number of construction projects LUMA plans to execute.

Objective: Pursue Project Delivery Excellence

The CCMO will closely monitor construction progress and spending, ensuring projects remain on budget. The CCMO will also ensure that risks and issues are tracked and dealt with, including records of all variances and justifications.

Objective: Enable Employees to Execute Operations Systematically

The CCMO will be experienced to mentor and train less experienced team members, thus enabling them to take on more responsibility. As such, the CCMO as a whole will gain experience and skills.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

The new CCMO will play a critical role in managing the large number of construction projects that will be federally funded.

2.6 Program Risks

If the CCMO is either not established or delayed, the following risks would apply:

- There would not be an alternative capability to oversee and monitor construction work across different sites and projects. There would also be no ongoing risk management for construction activities. Construction work would likely go over budget since site risks and issues will not be well monitored and mitigated.
- There would be no dedicated function to plan, monitor, track and evaluate construction progress vs construction plans for T&D projects, including those in the System Remediation Plan. As such, projects run the risk of getting delayed and/or running over budget.
- There would be no development of standardized construction related processes, plans, templates, procedures, checklists, forms, etc. This means there would be no firm-wide resources used to deliver construction activities.
- Project management teams would not be able to coordinate on how their projects are comparatively progressing. This would make it even more difficult for project managers to ensure that projects are on time, on budget and within scope.
- Contractors hired for construction work will not be subject to appropriate oversight and monitoring. This could result in additional contract changes and delays.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.7**	—	—	—
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

Description	Max. Staffing Level (Facilities, IT, Hardware)	Staffing Required for Standing Up
Construction and Commissioning Management Office	74	20
Assumed Staffing Level	74	20

3.3 Estimating Methods & Assumptions

- For this program LUMA has included full-time employees as per table above.
- Office facility, IT hardware, furniture and associated expenses are not included in this estimate.

Emergency Response Preparedness

1.0 Program Description

This program is focused on emergency response management. The program implements the ERP and establishes the OEMBC. Also included are establishment of a primary and alternate LUMA EOC, along with development and elaboration of plans, processes, and procedures to be enacted in the event of an emergency.

These will include measures to be put in place before, during and after a disaster. Additionally, the program supports acquisition of damage assessment software and accreditation from the EMAP.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA is responsible for the safe operations of the Puerto Rico Transmission and Distribution Electrical System which includes responding quickly and efficiently to any emergency or natural disaster. Through a gap assessment, interviews, and observations, LUMA has identified that the current emergency response preparedness and readiness is well below Prudent Utility Practice. This large gap leaves employees, the electrical system and customers unprotected.

The gap assessment included the following high-level event-specific observations:

- Major challenges in predicting the severity of storm damage and ensuring adequate resources (staffing and material) are on site and ready to go in advance or immediately after the storm.
- A poorly functioning OMS (lacking current connectivity information) and lack of proper IT visualization and analytic tools add to the difficulty of prioritizing and reporting on restoration efforts, along with adjusting regional staffing levels to match damage levels across the system.
- The restoration process does not have formal operating procedures and checklists, resulting in inconsistencies in service restoration protocols. This also leads to potential safety and operational hazards.

The overall emergency response uses a manually intensive approach from initial damage assessments to coordinating/deploying crews, to using logbooks to track system operations, to verifying/confirming service restoration places. All of this creates undue strain on the management of the service restoration process. Other gaps identified outside of event-specific responses include:

- Though the current EOC function is centralized (and then distributed to functions and then regions), it resides in two locations. When combined with technology constraints, this setup inhibits the capability to gain integrated and comprehensive situational awareness of the entire event. Constraints suggest the need for an incident management platform to display and share information; this will create more transparency that includes general incident overview, damage assessment data, status of transportation routes and inventory, incident command priorities, safety information and overall situational awareness to ensure a common operating picture.

- Varying levels of competence and familiarity with implementation of the Incident Command System (ICS) suggesting the need for training, exercises, and a formal certification process. This would start with the use of available online training modules along with targeted onsite training to fill gaps in the online modules.
- Resource planning needs to be further strengthened despite recent improvements. This includes developing more strategic relationships for mutual assistance, materials, and addressing gaps around specific skills and competencies.
- PREPA currently lacks major event management software, which is required to automate and integrate field-provided damage information into a full-scale management system (including assessments, generation of work orders, field team locations, restoration timelines, and justification for FEMA support).
- Manual damage assessment process: This affects the timeliness of and ability to integrate information from the field.
- Siloed approach to Emergency Response and Business Continuity Plan development and implementation.

As required under the T&D OMA, LUMA is preparing the ERP during the Front-End Transition Period. (T&D OMA, Section 4.2 (g). The ERP will include measures for appropriate and timely notice to PREB and other agencies, measures to coordinate effectively with other responders, measures for outage minimization and restoration (to be established in the Restoration Annex), and timely availability of emergency resources.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

Upon commencement of operations, LUMA will immediately implement the ERP developed during the Front-End Transition Period. LUMA will also have established a fully operational Office of Emergency Management and Business Continuity to ensure compliance with federal requirements and industry standards while managing the comprehensive emergency management and business continuity program. A NIMS-compliant ICS structure will be in place with staff trained on their roles and responsibilities permitting a safe and timely response and restoration process. Mutual aid agreements will be in place for external resources to promote collaboration and successful response and restoration on Level 1, 2, and 3 responses. The LUMA OEMBC will have obtained accreditation from the EMAP, the industry standard in emergency management programs.

LUMA's ERP will continue to enhance emergency operations, enabling LUMA to restore service to their clients as quickly and safely as possible. Maximum support from across LUMA will be provided to OEMBC and to EOC, when activated, and restoration efforts will be managed in accordance with the Major Outage Restoration Annex. To ensure alignment, the ERP will provide direction, control, and coordination while the Restoration Annex provides the guidance necessary for restoration prioritization and operational details for response.

Emergency Response Preparedness

LUMA will have a fully functional primary EOC established in a permanently fixed location with an alternate EOC location implemented. All equipment, technology, and staff will be in place and fully implemented with the necessary training.

LUMA will have an incident management platform in place to enable real-time information sharing, situational awareness, and documentation collection. Outage Event Management software will also be in place that allows daily operations staff to visibly see outages in real-time, relay information and enable the EOC to dispatch response crews to areas across the island. This will help to:

- Implement base restoration priorities
- Restore generation, then critical transmission, then substations, critical or priority customers, large volume customers then individual residences

2.4 Program Activities

- Identification and establishment of primary EOC location including acquisition / upgrading of equipment, technology, etc., along with establishment of alternate EOC location
- Establishment of Office of Crisis Management with EMAP accreditation
- Procurement and implementation of required tools, including: an incident management platform, a damage assessment platform, an event outage management platform, and a business continuity platform
- Development of training modules, exercises, and a formal certification process for employees in use of the ICS and the Restoration Annex A
- Development of an adequate resource plan to be implemented in emergencies, including development of more strategic relationships, materials, addressing skills / competency gaps, etc., and identification and reallocation of key system spares so that they are available and staged in strategic locations
- Development and implementation of communications strategy to educate stakeholders (e.g., Puerto Rico residents, government agencies, etc.) and engage local support for major outage events

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	

Emergency Response Preparedness

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

Better emergency response training will help reduce the risk of injury or fatality to employees, along with enabling them to meet LUMA and OSHA safety rules and required laws and regulations.

This program will also enable LUMA to respond more quickly and efficiently to outages and emergencies such as downed lines and traffic accidents, thereby reducing public safety risks.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Deliver Electricity at Reasonable Prices

Employees will be able to respond to customer needs quicker, especially in the case of outages. More streamlined emergency response also reduces their associated costs, as such allowing for electricity to be delivered at more reasonable prices.

Increases satisfaction due to better communication on outages, including being able to reach the call center, automated messaging and up to date Estimated Time of Restoration (ETR).

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

This program will help to reduce employee overtime requirements due to better planning and more focused actions to prioritize restoration. This will also lead to less employee downtime and higher employee satisfaction.

Emergency Response Preparedness

Better emergency preparedness will also help to improve both system and employee productivity. Systematic processes and procedures reduce the probability for error and ensure employee resilience.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

In the event of an emergency, disaster or catastrophic event, this program will aid LUMA employees to be better prepared to respond to outages, restore damaged infrastructure and make the necessary repairs more efficiently and expediently.

A robust ERP, the Major Outage Restoration Annex, Business Continuity Plan, and highly trained and qualified employees promote resilience and ensure success of the system.

This program will enable LUMA to follow best practices, comply with industry standards, and increase the reliability of response and recovery efforts across the organization.

2.6 Program Risks

There is a substantial downside risk to failing to pursue this program. An ERP and Restoration Annex are basic requirements for all utilities. These are particularly critical given the fragile current state of physical T&D assets. Given this, a well-organized approach to an event is of utmost importance. LUMA is also contractually obligated to deliver on this project as per the T&D OMA.

Furthermore, the current lack of proper plans and a preparedness training and exercise program severely limit LUMA's emergency response capability. Another large-scale incident such as Hurricane Maria would result in major outages occurring without a coordinated, efficient, and timely emergency response bringing detriment to the island.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.2**	**$1.6**	**$0.3**	**$1.4**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

Office space, equipment, and resources to operationalize the Office of Emergency Management and Business Continuity as well as the Emergency Operations Center to include funding for annual budget, along with software and hardware acquisition for:

- Incident management platform
- Event outage management platform
- Damage assessment platform

- Business continuity platform

3.3 Estimating Methods & Assumptions

Cost estimates are compiled based on estimated vendor costs and parent companies' experience. These estimates assume the following applicable standards and codes:

- OSHA
- IEEE
- LUMA's safety practices, programs, and work methods
- Prudent utility industry standards
- Labor law
- State law

Program Standards or Requirements include:

- FEMA
  - Comprehensive Preparedness Guide (CPG) 101: Developing and Maintaining Emergency Operations Plans
  - Comprehensive Preparedness Guide (CPG) 201: Threat and Hazard Identification and Risk Assessment Guide
  - National Preparedness Goal (NPG)
  - National Response Framework (NRF)
  - National Disaster Recovery Framework (NDRF)
- Presidential Policy Directive (PPD) 8 – National Preparedness
- Homeland Security Presidential Directive 5 (HSPD-5) – National Incident Management System
- Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended
- Post-Katrina Emergency Management Reform Act (PKEMRA), 2006
- Housing and Economic Recovery Act of 2008
- The National Security Strategy, May 2010
- Emergency Management and Assistance, Code of Federal Regulations, (CFR) 44
- Price-Anderson Amendments Act of 1988, Public Law 100-408, as amended
- Emergency Management Assistance Compact, Public Law 104-321
- National Incident Management System (NIMS), December 2008
- Homeland Security Presidential Directive (HSPD) 7: Critical Infrastructure Identification, Prioritization, and Protection, December 2003
- Executive Order 13347, Federal Register, Individuals with Disabilities in Emergency Preparedness
- Americans with Disabilities Act (ADA) of 1990
- ADA Guide for Local Governments, U.S. Department of Justice, July 2005
- Guidance on Planning for Integration of Functional Needs Support Services (FNSS) in General Population Shelters, November 2010
- Developing and Maintaining Emergency Operations Plans: Comprehensive Preparedness Guide (CPG) 101: Version 2.0 November 2010
- Sandy Recovery Improvement Act (SRIA) of 2013
- Disaster Relief Appropriations Act of 2013

Project Controls, Risk Management & Estimating Offices

1.0 Program Description

This program entails the creation of the Project Controls, Risk Management and Estimating offices within the Capital Programs department. The Project Controls office will be responsible for project scheduling, cost control and scope management, along with ensuring that projects operate on budget, on time and as per defined scope. The Risk Management office will be responsible for identifying project risks, analyzing risk probability, impact, and ranking, planning risk mitigation, and calculating required contingency levels for mitigating unavoidable risks. The Estimating office will be responsible for preparing project estimates, cost baselines, etc. for all capital program T&D projects. Each of these offices will be stood up and staffed under this program; however, contractor resources will supplement LUMA employees as needs for capital programs arise but will be managed and supervised through the appropriate offices under the department.

2.0 Program Rationale

2.1 Current State & Identified Gaps

The PREPA PMO was formed in 2017 and is currently responsible for a wide range of projects including fiscal year planning, PPOAs, accounts, invoicing, procurement, and contracts. Additionally, it is responsible for project related functions of project execution, project control, stakeholder management and reporting. All these functions have been rolled into one department; however, several key components are missing.

There is currently no office for project controls and no team responsible for associated functions such as schedule, cost, risk, and scope control.

There is also no risk management team within the PREPA PMO to identify, manage and control project risks.

This current state is entirely inadequate to manage the project controls, risk management and estimating functions for the large dollar per year planned capital program outlay for upgrades to the T&D infrastructure.

NEED/ISSUE

- Most major utilities follow Project Management Institute (PMI) standards. A project controls office is a standard office responsible for:
  - Establishing project work breakdown structure (WBS),
  - Cost and schedule baselines,
  - Scheduling, schedule monitoring and controls,
  - Cost baselining,
  - Cost monitoring & forecasting, and

  - Cost control, scope creep and scope management.
- Risk management and mitigation: Risks can derail a project if not identified, monitored, and tracked. Risk identification, probability and impact analysis, mitigation options and contingency analysis is an important function of a risk management office. A Risk Management office keeps the project manager aware of risks that can affect the associated project, along with providing guidance and support on how to mitigate them. This also allows for accurate and objective contingency calculations once the anticipated risk impacts have been analyzed. For construction works, a Construction and Commissioning Management office (CCMO) monitors onsite risks as they arise and liaise with the Risk Management office to define appropriate actions, mitigations, and contingencies.

MAJOR GAPS

- A dedicated Project Controls office is missing within the PREPA PMO. This office is required to support all project baselining, project monitoring and forecasting activities, especially to support project managers in oversight of large capital programs. The PREPA PMO has only two staff that track and monitor project costs solely by contractor invoicing. There is no schedule, scope, and cost baselining, without forecasted vs baseline tracking to check if projects are on time and on budget using productivity and efficiency calculations.
- There are very few projects control processes and those which exist relate exclusively to managing project budgets.
- Projects are controlled by comparing actuals vs budget, which does not meet requirements to manage scope, costs, and time in an integrated fashion.
- There is no Risk Management office to proactively identify, monitor and control project risks. Under the current structure, once risks become actual issues, they are managed by the PREPA PMO.
- PREPA project estimating work is also prepared by the project manager as there is no estimating team within PREPA for this work.
- There is no WBS within PREPA. Projects cannot be managed and controlled without having a WBS to manage.
- There are no internal processes for quality monitoring and quality control.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the program completed state, LUMA will have set up a well-organized project controls office within the Capital Programs department to be responsible for project scheduling, cost control and scope management, along with ensuring that projects operate on budget, on time and as per defined scope.

LUMA will also have set up a well-organized risk management office within the Capital Programs department to be responsible for identifying project risks, analyzing risk probability, impact, and ranking, planning risk mitigation and calculating required contingency levels for mitigating unavoidable risks. The LUMA CCMO set up under a separate program will feed into planning undertaken in the Risk Management office before construction on a capital project starts. The Risk Management office will also

have to assess and review new risks identified on site by the CCMO and work with them and the project manager to agree on how to mitigate any new risks.

Additionally, LUMA will have set up a well-organized estimating office, to be responsible for preparing project estimates, CBS, Work Breakdown Structure (WBS), cost baselines, etc., for all capital program T&D projects.

2.4 Program Activities (FY 2023)

- Continue to build up the Project Controls Office responsible for cost, schedule and scope monitoring and control on all projects
- Continue to build up the Risk Management Office responsible for identifying risks, risk analysis and risk mitigation on all projects
- Continue to build up the Estimating Office which will be responsible for detailed estimating, WBS, cost baselining and maintaining historical records of past project estimates
- Continue to develop in coordination with Finance and Regulatory a standard WBS template required for monitoring, forecasting, and controlling project costs and schedule
- Continue to develop and prepare project control processes (schedule control, cost control, scope control, risk, estimating), procedures, flow charts, knowledge bases and templates for all Capital Programs projects
- Continue to build up the Contract Administration group responsible for coordination, administration & monitoring of contracts, resolving conflicts with vendors and closing out contracts

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	

Project Controls, Risk Management & Estimating Offices

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

This program ensures that customers are kept well informed of project progress, costs, timelines, risks, delays and any issues, thus enhancing customer experiences.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Pursue Project Delivery Excellence

By including project controls, risk management and estimating offices under the Capital Programs department, this program will help to ensure LUMA's capability to launch, oversee and manage a large number of complex capital programs. These functions are also integral parts of building an industry standard Capital Programs department.

The LUMA Project Controls, Estimating and Risk Management offices will closely monitor project spending and ensure that projects are on time and on budget. These offices will also ensure that systems are in place to track risks and issues as they arise and record all variances and justifications. These offices will also coordinate with the Construction and Commissioning Management office discussed in a separate program brief for their respective functions as it relates to construction works during the design, planning and execution stages.

Objective: Enable Employees to Execute Operations Systematically

Experienced personnel within the Project Controls, Risk Management and Estimating offices will mentor and train less experienced team members. This will enable them to take on more responsibilities and improve skills associated with these functions. This process will improve both how employees are able to execute operations and overall project delivery.

2.6 Program Risks

- If the Project Controls office is delayed, there would be no WBS setup for projects and no accurate estimation of project costs. There would also be no standard processes, plans, templates, procedures, checklists, forms, etc. for projects. These are essential as the resources that are used to deliver project controls activities.

- If the Project Controls office is not set up, there would be no dedicated function to plan, monitor, track and evaluate project progress. This would apply to all T&D projects, including T&D rebuild projects within the System Remediation Plan. Without a dedicated office to compare actual vs. planned progress, all LUMA projects run the risk of being delayed or overbudget. Without a Project Controls office, project and construction teams would also not have adequate information on their progress and whether they are achieving projects on time, on budget and on scope.
- If the Risk Management office is missing, then projects would lack risk management oversight. This could result in project delays and budget overruns with risks and issues arising unexpectedly and negatively impacting the projects.
- Without an Estimating office, cost estimation and project planning will continue to be conducted on an ad-hoc basis, resulting in potential misalignment across the various project teams.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.3**	—	**—**	**—**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

Description	Max. Staffing Level (Facilities, IT, Hardware)	Staffing Required for Standing Up
Estimating	4	3
Project Controls Office	23	11
Risk Office	5	3
Assumed Staffing Level	32	17

3.3 Estimating Methods & Assumptions

- For this program LUMA has included full-time employees as per table above.
- Office facilities, IT hardware, furniture and associated expenses, and any other burdens, are not included in these estimates.

Capital Programs, PMO & Funding Management Office Setup

1.0 Program Description

LUMA is creating a dedicated Capital Programs department to manage the large number of capital improvement projects to be undertaken. The Capital Programs department will include T&D Project Management offices, a PMO and an IEM office to manage FEMA and other federal funding. This will replace the current PREPA PMO and also include specific project management capabilities.

The Capital Programs department will be responsible for executing and managing T&D projects. This execution will be handled through in-house resources, an EPC method or any combination of Engineering (E only) contractors and/or Procurement and Construction (PC) contractors. The Capital Programs department will fully manage and monitor the work of any contractors on T&D capital projects, including but not limited to those hired to engineer, procure, and construct T&D infrastructure.

2.0 Program Rationale

2.1 Current State & Identified Gaps

The PREPA PMO was formed in 2017 and is currently responsible for a wide range of projects including fiscal year planning, PPOAs, accounts, invoicing, procurement, and contracts. Additionally, it is responsible for project related functions of project execution, project control, stakeholder management and reporting.

LUMA's gap assessment of the PREPA PMO indicates a need to enhance project management capabilities for capital projects given the scale of the upcoming work. Further analysis also indicated that the collection and display of key project management data is below industry standards; current data is manually maintained with limited capabilities and minimal KPIs. The PREPA PMO is mainly focused on actuals vs. budgeted spending and contractor resources. Work in progress is collected from contractor invoicing rather than from physical progress completion. KPIs for project monitoring and tracking for scope, quality, risk, cost, and schedule are not available.

Given the wide range of functions currently under the purview of the PREPA PMO, and the results from the gap assessment, this unit is not adequately resourced and equipped to manage the large annual capital outlay required for upgrades to the T&D infrastructure.

The structure of the PREPA PMO does not reflect the capability standards required by the Project Management Institute for capital projects and project management. A PMO focused on capital projects would be responsible for establishing project management standards, processes, procedures, guides, project management software tools, KPIs, project management dashboards, progress reports, etc. The PREPA PMO currently does not include a dedicated office for managing capital programs.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

The completed program will include a comprehensive Capital Programs department which will be responsible for:

- Project planning
- Project management
- Project execution and closeout, including support for contract administration to manage high-dollar-value programs

In the completed state, each office under Capital Programs will be able to develop, track and display KPIs for project and program management relevant to their specific function, both for internal and external reporting. Other important functions under the Capital Programs department such as risk management, controls, construction, IT software and tools, etc., will be discussed in other program briefs.

As noted above, this program brief focuses on the following offices, which together comprise this program:

- Transmission & Distribution Project Management offices: Covers planning and management for transmission and distribution projects
- PMO: Drives planning, developing, implementing, and training related to process, procedures, tools, templates, etc. that will be used by all offices within the Capital Programs department
- IEM office: The IEM office will oversee funding management across all LUMA federally funded projects. In particular, the IEM office will be responsible for managing FEMA funding related to all capital programs, and providing administrative support, controls, and all communication with FEMA/COR3

2.4 Program Activities (FY 2023)

- Continue to develop the project management plans and subcomponent plans (schedule management, cost management, scope management, HSEQ plan, communication plan, risk management plan, procurement plan, contract management plan, construction plans, commissioning plans, etc.) for T&D projects
- Continue to develop the PMO related management plans, processes, procedures, flowcharts, templates, knowledge base, etc.
- Continue to develop the PMO dedicated to development of the Capital Program Execution Model roadmap and responsible for developing project management processes, procedures, tools, templates, and governance
- Continue to develop the Transmission and Distribution Project Management Office responsible for project initiation, planning, execution, monitoring and controlling and closeout of T&D infrastructure projects

- Continue to develop the federal funding management office (IEM) responsible for managing the FEMA funding for all Capital Program T&D projects including administration support, controls, and all communication with FEMA
- Continue to develop a Capital Programs training plan, training sessions, training manuals and user manuals, including training for project portfolio management tools, scheduling tools, cost control tools, contract administration tools and reporting tools
- Continue to develop KPIs to track and monitor project progress and health in terms of meeting scope, costs, time, and quality
- Continue to assess, plan and setup office facilities, IT hardware and furniture for the Transmission and Distribution Project Management, PMO and IEM offices
- Continue to manage and monitor external contractors working on Engineering, Procurement and Construction aspects of the T&D infrastructure projects to ensure completion on time and on budget
- Continue to implement and manage a procedural framework for identifying, collecting, transmitting, and filing controlled documents for Capital Programs
- Provide continuous improvement of processes to ensure that learnings from existing projects, regulatory advancements and changes to organizational framework are implemented within projects consistently and effectively
- Implement and deliver a Lessons Learned process and strategy to ensure future project success from previous learnings
- Initiate, plan and develop Quality Assurance / Quality Control (QA / QC) templates designed for monitoring process compliance

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☒ Restore Damaged Grid Infrastructure	Direct

Capital Programs, PMO & Funding Management Office Setup

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

The LUMA Capital Programs department will closely track and monitor project spending and ensure that projects come in on time and on budget.

Development of KPIs and the processes and tools needed to support them is an important element of utility best practice.

The department will also ensure that systems are in place to track risks and issues and record all variances and justifications.

Objective: Pursue Project Delivery Excellence

A dedicated Capital Programs department will help to ensure that transmission and distribution projects are responsibly managed, and that all relevant stakeholders (both internal and external, especially customers) are kept well informed of the project progress, costs, timelines, risks, delays, and any issues enhancing their experience.

Objective: Enable Employees to Execute Operations Systematically

The LUMA Capital Programs department will closely track and monitor project spending and ensure that projects are on-budget, that systems are in place to track risks and issues and record all variances and justifications. It will be well staffed and equipped to manage the large number of projects that will be required to be planned and executed every year.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

The IEM office will be responsible for liaising with FEMA to support funding for all capital programs. This dedicated relationship will allow for clear lines of communication with FEMA and ensure proper administration support, controls, and communications with FEMA.

Additionally, the IEM Office will work with relevant offices under the Capital Programs department (including the PMO) such that all FEMA requirements (including reporting and structural requirements) continue to be met on an ongoing basis.

Objective: Restore Damaged Grid Infrastructure

By providing oversight across all capital projects, the Capital Programs department will help to ensure the required investments to restore damaged grid infrastructure, along with making sure these are made on time and on budget.

Objective: Improve Resilience of Vulnerable Infrastructure

The Capital Programs department will manage and oversee all capital projects, including investments to improve resilience of existing infrastructure.

2.6 Program Risks

If creation of the Capital Programs department is delayed, there would be no dedicated oversight function across LUMA's capital projects. The implications of not establishing this department are inefficiencies, delays and cost overruns associated with poorly managed capital projects.

There would also be no capability to own, plan and manage the T&D infrastructure rebuild which is vital to the improvement of electrical service, public safety, and employee safety.

If the PMO is delayed there would be no processes, plans, templates, procedures, checklists, forms, etc., for use across LUMA. As such, project teams would be missing key resources to deliver projects.

If creation of the IEM office is delayed, then there would be a delay in submitting project data to FEMA and other federal organizations. This would in turn delay execution of federally funded projects. Such delays could also delay other projects as there would be no dedicated office to arrange project funding prior to project start.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.2**	—	—	—
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

Description	Max. Staffing Level (Facilities, IT, Hardware)	Staffing Required for Standing Up

Capital Programs, PMO & Funding Management Office Setup

Description	Max. Staffing Level (Facilities, IT, Hardware)	Staffing Required for Standing Up
PMO	18	8
Project Management	43	18
IEM	30	15
Assumed Staffing Level	91	41

Estimating Methods & Assumptions

The cost estimates for this program are based on the staffing levels shown above.

C.7 Support Services Portfolio

The Support Services portfolio includes key cross-functional programs that affect/serve all LUMA teams and departments. They include HR programs for attracting and retaining a high performing employee base through standardized processes for performance management, talent management, succession planning, recruitment and onboarding management, learning management and compensation management. Other programs include implementation of processes and tools to secure information resources while permitting appropriate access to authorized stakeholders at any time and at any location through information systems that are prudently maintained. The portfolio also includes regulatory studies and plans that inform the development of a more detailed roadmap for meeting IRP milestones. Table C-9 below presents a summary of the program spending for the largest programs in the support services portfolio, followed by a short description of each program.

Table C-9. Support Services Portfolio Spending Estimates by Program ($ million, real)

	FY2023				FY2024	FY2025
Support Services Programs	**Federal Funded Capital**	**Non-Federal Funded Capital**	**OpEx**	**Total Spending Estimate**	**Total Spending Estimate**	**Total Spending Estimate**
HR Programs	-	0	62	63	64	65
Renewables Integration, Minigrids & Generation Studies	-	3	5	8	4	2
IT OT Asset Management	6	0	1	7	3	6
Update to Third Party Use, Audit, Contract and Billing Procedures	3	-	3	6	4	4
IT OT Cybersecurity Program	-	2	2	4	5	6
IT OT Enablement Program	-	1	2	3	3	4
Critical Financial Systems	-	3	0	3	3	1
Critical Financial Controls	-	-	2	2	1	-
Land Record Management	-	1	2	2	2	2
Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking	-	-	1	1	-	-
Improvements to Systems Dispatch for Increased Reliability and Resiliency	-	-	1	1	-	-
Land Acquisition & Dispute Management	-	-	1	1	1	-
Financial Management Functions	-	-	1	1	1	1
Waste Management	-	-	0	0	0	0

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	FY2023				FY2024	FY2025
Support Services Programs	**Federal Funded Capital**	**Non-Federal Funded Capital**	**OpEx**	**Total Spending Estimate**	**Total Spending Estimate**	**Total Spending Estimate**
IT OT Collaboration & Analytics	-	0	-	0	0	2
Integrated Safety & Operational Management System	-	0	0	0	0	0
Safety Equipment	-	0	0	0	0	0
Public Safety	-	-	0	0	0	0
Grand Total	**9**	**10**	**84**	**102**	**92**	**91**

Note: Spending estimates include federally funded and non-federally funded capital expenses and program-specific operational expenses. General O&M expenses not directly allocated to specific programs are not included.

HR Programs. This Program Brief covers four separate programs to support the LUMA Human Resources (HR) department. This includes the following programs:

- **Employee benefits**. LUMA will implement industry competitive benefits programs for its employees, including competitive benefits such as an EAP, LTD, STD, Life Insurance, and a defined contribution plan (401(k)).
- **Employee engagement**. LUMA will launch an employee engagement strategy to ensure all employees feel part of the new LUMA family, and they feel engaged with decision making and their long-term career progression. The comprehensive employee engagement strategy includes employee activities, regular employee surveys, volunteerism, town halls, career growth opportunities and spaces where employees can express their feedback. Communication is key for employee engagement
- **Training**. LUMA will implement core compliance training to ensure employee understanding and compliance with all corporate policies and procedures and Commonwealth Laws and Regulations, to support and promote appropriate conduct. In addition, all functions across LUMA will implement comprehensive training programs meeting the minimum requirements necessary to improve employee skill sets, bringing performance to Contract Standards.
- **Support software**.The implementation of Human Capital Management software is to introduce standardized processes for management of employee data, employee performance management, talent management, succession planning, recruitment on-boarding and off-boarding management, learning management and compensation management. It will also provide employee and manager self-service capabilities. This is a key element that will support contemporary HR practices.

Renewables Integration Studies & Implementation. This program involves completing planning, technical studies, program development, and pilot implementation related to support compliance with the IRP and regulatory requirements related to renewable integration, distributed energy resources and generation. The activities conducted in this program will lead to a coordinated, data-driven approach to the energy transition.

IT OT Asset Management. LUMA will introduce industry standard IT OT asset management procedures and provide the necessary system upgrades to ensure secure business operation and continuity, as well as improved customer responsiveness. The scope of the program includes assessing PREPA's

application and infrastructure portfolio and beginning a series of software and infrastructure upgrades that drive toward a transition to cloud-based technology. IT OT resilience in this program also extends to the establishment of a new backup data center to ensure reliability and resilience of technology systems.

Update to Third Party Use, Audit, Contract and Billing Procedures. This program is focused on updating procedures for third party use of land, use of infrastructure, audits, contracts, and billing. The program will include:

- Developing consistent processes and agreement templates to ensure compliance with legislation.
- Streamlining and improving customer service for third parties who wish to use pole infrastructure.
- Establishing annual billing to third parties to ensure they are paying the associated fee to attach to each individual structure (either overhead or underground).
- Completing updates and corrections to the CC&B system to ensure data accurately reflects the current asset management joint use attachment numbers and identifies responsible billing parties; and
- Implementing necessary changes to the billing process for joint use billing, which may include contract updates and renegotiation.

IT OT Cybersecurity Program. This program focuses on the establishment of a cybersecurity program that protects key organizational assets including people, resources and technology. The program will ensure that cyber risk, internal and external threats, vulnerabilities and natural disasters are identified and mitigated based on risk and readiness factors. Improving cybersecurity is a critical part of hardening the T&D System and PREPA business continuity. Cyber risks could severely affect T&D System operations potentially even to the point of widespread failure. The program will design and implement the people, processes and technologies essential for effective cybersecurity governance, cybersecurity operations and monitoring, vulnerability identification and management, and cloud security.

Key to this program is the ability to defend against cyber incidents. A cyber incident is an event that has a negative impact on the organization. This includes but is not limited to data breaches, damage to systems (physical or digital), loss of system control or operations, lack of confidence in or accuracy of data, ransomware, phishing, theft, natural disaster (loss of ability to operate), equipment/system failure and unauthorized access. By ensuring the confidentiality, integrity and availability of assets in compliance with Section 13 of the T&D OMA, the cybersecurity program will proactively mitigate risk and enable business operations by identifying and reducing the risk and impact of a cybersecurity incident to the organization.

IT OT Enablement Program. This program will implement capabilities to deliver and maintain IT OT services and systems enabling LUMA operations through the implementation of industry best practices and standardized processes and tools. Fit for purpose devices will be deployed to carry out business operations enabling near real-time access to electric network data providing a safer work environment. Industry best practices for Information Technology Service Management (ITSM) will be implemented so that technology assets are managed, provisioned and maintained securely. Processes will be implemented to establish end user device standards along with Mobile Application Management (MAM) to control how end user devices are used. Enterprise Architecture (EA) and project management frameworks will be implemented to ensure software and infrastructure assets are implemented, maintained and disposed of in accordance with vendor support requirements including patching and upgrades. This will mitigate the risk of prolonged system outages on non-vendor supported software and infrastructure. By the end of the program LUMA will have developed and executed an operational data strategy, developed foundational enterprise architecture guidance and outlined a cloud strategy. LUMA's

Annual Budgets

IT and OT organization will be able to design, plan, deliver, operate and control the lifecycle of IT OT services, projects and assets. An IT service management tool will ensure that technology is managed, provisioned and maintained securely to reduce risk to the organization and enable users.

Critical Financial Systems. This program covers the technology projects for Finance and Facilities, including financial management systems and technology, risk management systems and supply chain management technology. The initiatives cover areas within budgeting, reporting, consolidation, risk management, time tracking, employee expenses, fixed asset subledger, procurement, and a major life cycle upgrade for the Oracle E-Business Suite (EBS) system. These initiatives are required to maintain a supported version of the financial applications or to address gaps identified in the financial management area.

Critical Financial Controls. The Critical Financial Controls program focuses on two key areas, internal control and internal audit. These two areas will build skills and capabilities in financial reporting and audit; and will update and enforce industry standard policies and procedures that comply with the latest laws and regulations. Internal Controls will address various internal control items, including obtaining and reviewing service organization controls for major vendors, the implementation of key transaction controls, reconciliations, validation, physical inspections, documentation evidencing performance of control tasks, disclosures, enforcement of applicable policies and procedures for employees to identify deviations, the establishment of a formal plan for communications with the audit committee and the revamp of the internal audit department. Internal Audit builds the foundation of the internal audit team as well as the development of the methodology and process, along with building and retaining the required skills and technology base.

Land Record Management. LUMA will develop a new record management system that allows for land information to be found easily and managed to utility industry standards. This allows compliance with legal requirements to be documented and shown to satisfy regulators. It also allows user groups to have efficient access to information. In particular, such a system lets Operations and Construction perform their work while respecting land rights agreements.

Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking. This program focuses on planning studies for dispatch of existing thermal units, along with new processes to audit costs included in the purchased power and fuel cost adjustment mechanism tariffs administered by LUMA in accordance with Section 5.6 of the T&D OMA. The program includes creation and implementation of reasonable prudent administrative procedures for reporting of those related fuel and other generation costs as described in the T&D OMA and being able to accurately present these costs to the PREB.

Improvements to Systems Dispatch for Increased Reliability and Resiliency. This program deals with the repair of non-functioning equipment and processes to allow for the System Operator to have data to carry out economic dispatch of generation assets, in accordance with the System Operation Principles and applicable procedures, and to allow for the safe and reliable operation of the system.

Land Acquisitions & Dispute Management. LUMA will introduce processes and procedures from land management industry practice to: (i) manage records, (ii) carry out land acquisition, (iii) interact with landowners to resolve disputes, and (iv) begin to establish landowner relations concepts within the land management practices.

Annual Budgets

Financial Management Functions. This program addresses financial management functions including procurement and contracting, real estate, and risk and insurance. Includes:

- Procurement: Setting up a strategic sourcing function for procurement, along with standard processes, procedures and accountabilities for procurement and contracts
- Real estate: Defining processes to clarify accountabilities and approval limits, along with executing a contract with a third-party real estate advisory firm for assistance with property identification, disposition, acquisition and ongoing transaction support
- Risk and Insurance: Putting in place a risk and insurance team and fully functional Enterprise Risk Management (ERM) system

Waste Management. In accordance with the requirements of the T&D OMA Section 5.10 and the scope of T&D OMA Services specified in Annex I, LUMA will install new equipment and implement management processes to comply with environmental statutory requirements and support safe and efficient operations. The program includes installing secondary containment to prevent contamination, ensuring proper containers are in place to store wastes and, when required for site operations, processing or removal of accumulated waste debris. LUMA will take actions with respect to pre-existing environmental conditions, including accumulated waste, in accordance with the T&D OMA Section 5.10(b).

IT OT Collaboration & Analytics. LUMA will upgrade and implement technology solutions to support collaboration across the organization, provide employees with access to relevant content to do their work, the ability to track the performance across the organization and the ability to drive data-based decision making through the use of analytics. This program also includes development of a strategy, along with target architecture and the associated roadmap, for a data analytics structure to better support critical decision making across the company. The program will also implement a centralized repository for internal and external reporting of performance metrics and expand data sources as business needs dictate.

Integrated Safety & Operational Management System. LUMA will centralize policy and procedure creation by using a fully integrated, efficiently managed internal safety and operational management system that will allow communication of requirements to all employees and monitor health, safety and environmental compliance organization wide. The system will have clear operational procedures and controls and will be easy to use and easily updated.

Safety Equipment. To improve employee and public safety LUMA will procure critical safety equipment and associated supplies such as Automated External Defibrillators (AEDs), portable eye wash, lone worker/confined space entry monitors and audiometric testing equipment. These items critically improve employees' current state of work-related injuries and illnesses as per OSHA requirements and recommendations.

Public Safety. LUMA will introduce an organizational strategy to engage and educate the public on safety around electric equipment and installations, thereby reducing public safety incidents. The program will include the procurement of public safety related materials for training awareness and public outreach, the development and complete roll out of a communications plan and a continuing maintenance plan for the program.

HR Programs

1.0 Program Description

This program brief covers four distinct areas to support the LUMA HR department. This includes the following.

EMPLOYEE BENEFITS

LUMA will implement industry competitive benefits programs for its employees, including competitive benefits such as an EAP, LTD, STD, Life Insurance, and a defined contribution plan (401(k)).

EMPLOYEE ENGAGEMENT

LUMA will launch an employee engagement strategy to ensure all employees feel part of the new LUMA family, and they feel engaged with decision making and their long-term career progression. The comprehensive employee engagement strategy includes employee activities, regular employee surveys, volunteerism, town halls, career growth opportunities and spaces where employees can express their feedback. Communication is key for employee engagement

TRAINING

LUMA will implement core compliance training to ensure employee understanding and compliance with all corporate policies and procedures and Commonwealth Laws and Regulations, to support and promote appropriate conduct. In addition, all functions across LUMA will implement comprehensive training programs meeting the minimum requirements necessary to improve employee skill sets, bringing performance to Contract Standards.

SUPPORT SOFTWARE

The implementation of Human Capital Management software is to introduce standardized processes for management of employee data, employee performance management, talent management, succession planning, recruitment on-boarding and off-boarding management, learning management and compensation management. It will also provide employee and manager self-service capabilities. This is a key element that will support contemporary HR practices.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

The current state and identified gaps across different areas of HR include the following:

EMPLOYEE BENEFITS

PREPA offers a large and out of date benefit program including a severely underfunded defined benefit pension system. The system is complex, not well understood by employees and very expensive and difficult to administer. The various programs and systems have not evolved as the industry has changed and evolved.

HR Programs

LUMA offers an industry leading set of health and welfare benefits and then in addition provides further options for employees for items like supplemental benefits such as life or disability insurance. A professionally managed 401k supports employees to save for retirement and provide opportunities for financial education and literacy, all of which serves to create more engaged and loyal employees.

EMPLOYEE ENGAGEMENT

PREPA does not have a structured employee engagement strategy and therefore, does not measure employee engagement. They do not carry out activities that allow for employees to feel their voices are heard, or that help them feel part of a wider corporate community. Not only does effective engagement have the potential to significantly affect employee retention, productivity and loyalty, it is also a key link to customer satisfaction, company reputation and overall stakeholder value.

TRAINING

PREPA training programs are not up to industry standard nor meet the minimum requirements for LUMA to perform in accordance with Contract Standards. The LUMA training program is in process to include specialized training courses to meet mandatory legal requirements and help employees gain the minimum essential knowledge and learning experience for all functions.

SUPPORT SOFTWARE

The current support systems exhibit the following:

- Lack employee self service capabilities
- Lack performance, compensation, talent management and learning management strategy
- Lack career planning and succession planning program
- Lack documented policies and processes
- Lengthy manual processes are used for for benefits enrollment, training compensation, performance management, onboarding, and HR metrics
- Lack data on employee engagement levels and HR metrics

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

TRAINING

In the remediated state, core compliance training will have been administered to all LUMA employees to ensure understanding and compliance with all Corporate policies and procedures, Commonwealth and Regulations, to prevent inappropriate conduct. The remediated state within the first year of operations post Commencement Date whereas all employees hired into LUMA at time of Commencement will be required to partake in specific training as part of the onboarding process.

The following are examples of core compliance training required to achieve a remediated state:

- Workplace Bullying and Harassment
- Sexual Harassment
- Drug and Alcohol Awareness
- Equality and Diversity

- Social Media, Email and Online Etiquette
- Anti-Bribery & Anti-Corruption

Core compliance training for employees is a priority for the organization to reduce the risk of harassment claims, motivate employees to recognize, report and prevent misconduct, and help create a respectful, inclusive workplace culture. Upon completion, all employees in LUMA will have received the required trainings and knowledge they need to perform their job safely and conduct themselves appropriately in the workplace. This is an essential step for effectively addressing and preventing misconduct. This training will be taken yearly. However only the need to complete the initial training will be part of the SRP.

2.3 Description of Program Completed State

The program completed state will include the following.

EMPLOYEE BENEFITS

In the completed state all employees will have access to a competitive benefits suite which will include supplemental benefits such as life insurance, disability insurance, an EAP, and a defined contribution plan. These industry competitive benefits will help solidify LUMA's reputation as an employer of choice in Puerto Rico, helping LUMA attract and retain the best talent.

EMPLOYEE ENGAGEMENT

LUMA will have implemented a comprehensive Employee Engagement Strategy. The most important aspect of this strategy will be implementation of better communication with all employees.

The strategy also includes employee activities, regular employee surveys, volunteerism, town halls, career growth opportunities and spaces where employees can express their feedback. Employees will feel that management values and takes note of their views, and that they are part of a wider LUMA family. Through its employee engagement, LUMA will be seen as following through on its ambition of being an employer of choice in Puerto Rico. Talent that has been hired or developed will be more easily retained. Potential highlights include:

- Periodic ongoing events, e.g., onboarding touchpoints & focus groups which will allow employees to provide feedback on their onboarding and recruitment process
- Prescribed scheduled events, such as quarterly Town Hall meetings, focus groups, employee appreciation events & volunteerism to provide opportunities for open discussion and interaction with fellow employees and the community
- Roll out a formal engagement program that includes formal Engagement Surveys that will identify areas of improvement to be incorporated into LUMA action plans

TRAINING

Upon training program implementation, a learning platform will be available for all LUMA employees, which includes training modules for a wide range of functions. Specific courses and learning paths under this platform will be assigned to eligible employees based on their roles, with specific training programs administered by SMEs as needed. The learning platform will track completion of the different trainings for employees such that completion and performance can be monitored on an ongoing basis. As such, all employees in LUMA will receive the required education to perform their jobs securely. Employees will recognize that management has invested in their career development and this will improve employee

engagement levels as well as provide a safer workplace, efficient service delivery and improved customer experience.

SUPPORT SOFTWARE

Upon implementation, all HR processes will be managed in a single, modern platform, eliminating excess physical documentation, improving process control and avoiding duplication of labor.

2.4 Program Activities

EMPLOYEE BENEFITS

- Engagement of a welfare plan vendor to administer the life, accidental death and dismemberment (AD&D), short-term and long-term disability plans
- Development of an implementation and roll out strategy for each set of benefits
- Development and subsequent implementation of an internal communication strategy to educate PREPA legacy employees newly employed at LUMA about the new benefits structure
- Development and subsequent implementation of an external communications strategy that forms part of the hiring strategy to make LUMA an attractive employer of choice in Puerto Rico

EMPLOYEE ENGAGEMENT

- Development of an overall strategy for employee engagement including:
  - Approval, planning and execution of events and activities
  - Engagement plan through surveys, town halls and other feedback media
  - Volunteerism plan
  - Communication of career growth opportunities
  - Employee survey development and configuration

TRAINING

- Implementation of a learning platform through Workday Human Capital Management (HCM)
- Identification of required learning for needed functions
- Courses or learning paths are assigned to eligible employees
- Required courses are completed
- Performance and learning monitoring on an ongoing basis

SUPPORT SOFTWARE

- Definition of the HR Information System (HRIS), benefits, compensation, recruitment and learning modules implementation project teams
- Development and monitoring of project plans
- Testing of modules
- Training of employees on use of the platform
- Formal launch of the modules

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

HR Programs

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Indirect
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Direct
	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☒ **Other**	☒ Other	Direct

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

Training: Well-trained employees will directly impact workplace safety by putting into practice acquired skills and practices

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Increase Service Reliability

Employee engagement: Better engaged employees will be indirectly incentivized to provide better service to customers and improve service reliability.

Training: Trained employees will directly impact service to customers by providing excellent customer service skills acquired through LUMA's training program

HR Programs

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

Employee engagement: Engaged employees have higher morale and are more motivated employees. Raising moral is critical to raise employee performance and achieve company goals.

Training: Well-trained employees will directly impact delivery and execution of services by applying learned skills.

Support software: A modern Human Capital management platform and the appropriate training to users, has directly impacted Human Resources processes, enabling better project delivery and supporting employees in their work, thereby supporting operational excellence.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure
Objective: Improve Resilience of Vulnerable Infrastructure

Training: Well-trained employees will be able to restore and improve resiliency of the grid infrastructure by applying specialized learned skills.

PRIMARY GOAL: OTHER

Objective: Other: Attract Talent, Increase Employee Retention & Provide Incentive for Improved Performance

Employee benefits: Offering a competitive benefits program is critical to maintain employee engagement, leading to improved performance. Structured the right way, the benefits program will be a crucial pillar in building LUMA's reputation as an employer of choice. The benefits program should also result in higher morale and better incentives for improved performance.

2.6 Program Risks

- **Employee benefits:** Not introducing competitive benefits risks higher turnover, and an inability to create and cement a reputation as an employer of choice, weakening LUMA's ability to attract talent.
- **Employee engagement:** The lack of employee engagement can lead to increased turnover, which results in increased hiring costs. It can also lead to lower morale and motivation, which can lead to lower performance standards.
- **Training:** The lack of specialized, modern and up to industry standard training can lead to workplace safety incidents, which can severely impact performance and company brand. Customer service can also be directly impacted as employees without proper training will not be able to provide the expected service delivery.
- **Support software:** The primary risk of not proceeding with this software implementation is that human capital management will continue to be managed in an ad hoc and manual manner limiting LUMA's ability to monitor employee activities. The processes will continue to be lengthy and manual which will negatively affect performance levels and increase the risk of human error. This limits the ability to respond to employee requests in a timely and appropriate manner.

HR Programs

Another risk is the lack of compensation management and learning management for employees which impacts the employee experience at LUMA and LUMA's reputation as an employer. Not proceeding with this program may cause employees to seek different employment opportunities in Puerto Rico.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$62.8**	**$63.6**	**$64.5**	**$480.0**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

EMPLOYEE BENEFITS

- HCM system for administration of programs
- LUMA internal and external communications resources

EMPLOYEE ENGAGEMENT

- Internal communications resources
- IT OT support for communication

TRAINING

- Implementation of Workday HCM Learning module.
- Identification of required education external resources.
- Training programs will be administered by the Workday HCM Learning Module or Training managers and coordinators (internal and external). Particular training modules will require trainers, writers and training consultants, along with training materials, props and training specific technologies. Specific training modules may have dedicated location requirements, with overnight stays and travel depending on the training location.

SUPPORT SOFTWARE

- Identification of required modules for the HC management system to be acquired
- Resource requirements are as follows:
  - System integrator
  - Project manager
  - Systems analysts / business analysts
  - Subject matter experts
  - Reporting Manager

3.3 Estimating Methods & Assumptions

[redacted]

HR Programs

- **Employee engagement:** Costs per annum vary according to planned events.
- **Training:** Costs vary per function based on learning needs.
- **Support software:** The costs associated with the implementation of the Human Capital Management solution is estimated using the IBM Project Cost Estimator for implementing a leading Human Capital Management solution. Pricing assumptions are based on experience with utilities of similar size to implement human capital management solutions.

3.4 SRP Program Timeline & Milestones



Renewables Integration Studies & Implementation

1.0 Program Description

This program involves completing planning, technical studies, program development, and pilot implementation related to support compliance with the IRP and regulatory requirements related to renewable integration, distributed energy resources and generation. The activities conducted in this program will lead to a coordinated, data-driven approach to the energy transition.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA is tasked to file an IRP every three years. The latest IRP Resolution and Order, issued in August 2020 established targets related to renewable and battery storage integration, implementation, energy reductions through implementation of energy efficiency initiatives, and generation retirements. There are significant gaps in understanding of the current state of the system and its ability to handle these transformational changes. Until these gaps are filled, it is unclear how the IRP targets can be achieved without compromising system reliability, which is already compromised based on our assessment of system operations.

2.1.1 Additional Gaps Identified Post Commencement

Additional gaps were identified relating to the utility's preparation for the impact of hosting capacity and electric vehicles on the grid. System limitations to overcome include older system designs that inherently limit DER and EV integration. Outdated distribution feeder models and customer connectivity data are among the most critical gaps. In addition, the utility has not previously conducted data collection or research on EV penetration that would enable accurate, detailed forecasting and analysis of grid impacts related to EV adoption.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the completed state, LUMA will have completed the studies required under the approved IRP. LUMA will also have collected the technical data, conducted research, planning and program development activities to support compliance with the IRP and enable the energy transition.

2.4 Program Activities

Major activities in this program include:

- Distribution Hosting Capacity Studies(s)
- Utility Scale renewable integration
- Distribution renewable integration Offshore wind study
- Palo Seco power plant planning study

Renewables Integration Studies & Implementation

- Distributed Energy Resources (DER) pilot planning and implementation

FY 2023 will primarily involve laying the groundwork for the programs required to meet IRP targets, to prepare for launch when the funding mechanisms are approved. Timing will also depend on schedule of procurement of new generation, including the potential combined cycle plant in or near San Juan. This preparatory work will involve preparing requests for proposals, selecting contractors to perform research projects and studies, and managing project execution. After studies are completed, program activities will shift to developing resource acquisition plans incorporating the results of research.

The studies in the program are summarized below.

DISTRIBUTION HOSTING CAPACITY STUDY

Enabling hosting capacity maps which will assist LUMA's engineers and the customer service team to safely approve behind meter renewable projects, expediting the integration and activation of net metering. The study result will also guide developers to those areas where renewable sources integration causes less impact and are, thus, the most cost effective to target.

TRANSMISSION RENEWABLE INTEGRATION

Locational Marginal Value Study at transmission and sub-transmission system level to identify economical and optimal capacity and location of PV, Energy Storage Systems (ESSs) and PV/ESS. The study will focus on identifying mitigation of renewable resource impact, congestion management and capacity deferral.

The study will guide renewable developers to nodes and renewable capacities with lower interconnection cost and with the highest potential to improve system security violations in the 115kV system, reliability to critical customers supplied at 38kV, increase resilience of transmission centers and distribution substations, as well as to support orderly islanding where this may be a future option.

DISTRIBUTION RENEWABLE INTEGRATION

The IRP approved aggressive renewable energy integration by 2040. The approved renewable integration levels require validation via Distribution studies, with the following objectives:

- Identify economical and optimal capacity and location of primarily ESS placement to increase PV penetration and identify capacity deferral opportunities.
- Identify the maximum renewable capacity the Distribution system can integrate in the current system condition and identify investment levels to increase system capacity to accommodate additional renewable or DER.
- Guide renewable developers to aim at areas, zones and nodes where energy resources (PV, ESS, PV/ESS, others) will provide more value to the T&D system. This will also enable distribution planners to optimize the capital expenditures and renewable developers to substations and feeder sections with potentially lower interconnection cost.

WIND STUDY

PREB has ordered PREPA to conduct an offshore wind study tailored to Puerto Rico's wind resources, electric grid current and future conditions. PREB requires anchored and floating wind turbine options be evaluated. The study should be filed with PREB within two years from date of final resolution.

Based on Puerto Rico's vast offshore wind resources the study will evaluate the impact on overall energy as well as the possible locations, available wind generation capacity, technology (anchored, floating wind turbines options) and potential locations and costs for interconnecting to the transmission system.

This will also provide input for the transmission LMVS and future IRP development. The study also covers onshore wind resources.

This study will focus on the economic and system impact of a new combined cycle power plant, planned for Palo Seco or another site in or near San Juan by PREPA. It also covers two alternatives: the first being based on utility scale renewable generation coupled with energy storage and the second based on microgrids.

DISTRIBUTED ENERGY RESOURCES (DER) PLANNING AND IMPLEMENTATION

This activity was initially intended to include the Energy Efficiency (EE) and Demand Response (DR) Market Baseline and Potential Studies and 3-Year Plan development. However, the Energy Bureau chose to conduct these studies through instead of assigning them to the utility. In addition, the Bureau finalized the EE Regulation which established a new "Transition Period" for EE and DR program implementation. The final regulation introduced a new set of requirements that accelerated the planning and implementation timeline for EE and DR programs/pilots. As a result, the activities initially contemplated under this program are no longer necessary and have been replaced with pilot planning and implementation to meet the new regulatory requirements.

2.4.1 Additional Activities Identified Post-Commencement

- Additional activities were identified post-commencement related to Energy Efficiency, Demand Response and Electric Vehicles to meet changes in regulatory requirements due to PREB introducing a new Resolution and Order requiring LUMA to prepare a Phase 1 Electric Vehicle (EV) Infrastructure Plan. This activity has been expanded to include the planning and implementation of EV programs, pilots and services.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	

Renewables Integration Studies & Implementation

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☒ Enable the Sustainable Energy Transformation	Direct
☐ **Other**	☐ Other:	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability
Objective: Deliver Electricity at Reasonable Prices

The studies provide timely response and approval to renewable integration requests and guide customers and developers to areas, regions and nodes where renewable resources will add more value to the grid with contained overall cost. The studies are aligned with LUMA's vision to increase customer satisfaction by providing information that will increase service reliability and reduce energy prices.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Employees to Execute Operations Systematically

Operational Excellence can be achieved by understanding and planning for the impacts (positive or negative) of the integration of new technologies and mitigation options. Studies will guide planners on renewable sources integration during the execution of the SRP, potentially improving capital projects execution.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

This program could study implementation of microgrids, which could improve the resilience of targeted areas and/or associated critical infrastructure during storms and severe weather events. The studies will enable improved system resilience when the sustainable energy transformation is completed, ensuring existing system infrastructure is rebuilt to accommodate penetration of intermittent distributed resources within the microgrids.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Enable the Sustainable Energy Transformation

The studies will enable the sustainable energy transformation by ensuring system infrastructure is rebuilt to accommodate a higher penetration of renewables and distributed energy resources.

2.6 Program Risks

Without this program's planning studies LUMA will be unable to ensure cost-effective, stable integration of renewable energy and distributed energy resources. These studies are required to for LUMA's compliance with IRP requirements. If LUMA does not comply with regulatory mandates, it faces the potential for fines. These fines are stated in Law 17-2019, Section 5.32 (Amended Act No 57-2014, 6.36 –

penalties) which states *"The Energy Bureau shall impose administrative fines for violation of the Act (Law), or the regulations and orders issued thereunder, committed by power company… Fines can go up to $25K per day, 5% of gross sales, 15% of net income or 10% of net worth."*

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$7.6**	**$4.2**	**$2.0**	—
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

A team of planners, managers and engineers will manage execution of the studies and consulting services.

3.3 Estimating Methods & Assumptions

The cost estimation comes from previous similar engagements conducted in mainland US states for utilities, or of similar size (e.g., more than two million customers).

Initial studies and program plans developed in LUMA's first few years move towards implementation. With this progression in the integration of renewable energy, PBRE 7 budget decreases over time.

IT OT Asset Management

1.0 Program Description

LUMA will introduce industry standard IT OT asset management procedures and provide the necessary system upgrades to ensure secure business operation and continuity, as well as improved customer responsiveness. The scope of the program includes assessing PREPA's application and infrastructure portfolio and beginning a series of software and infrastructure upgrades that drive toward a transition to cloud-based technology. IT OT resilience in this program also extends to the establishment of a new backup data center to ensure reliability and resilience of technology systems.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA is charged with the overall management of over 200 enterprise and operational technology assets, including the backup of technology assets in a safe and secure manner. A significant number of the software solutions are customer standalone systems with 90% of the infrastructure being at end of support/end of life. This includes substation RTU and SCADA related equipment. Another significant gap and safety concern is the absence of a fully functional voice radio system for workforce management.

The current state of the IT OT Asset Management processes and the maintenance of technology assets corresponds to a low maturity score in the gap assessment. This indicates that PREPA is aware of the need to address the elements that define competent IT OT Asset Management and is starting to apply them in specific areas of critical IT OT Assets that enable key business functions. Gaps requiring remediation exist in all areas of IT OT Asset Management. For example:

- There is no formal documented IT OT asset management strategy, nor are there processes or tools aligned to an industry best practice.
- There is no centralized repository for tracking and managing software solutions and infrastructure, resulting in end-of-life assets and increased risk of security breaches. Additionally, there is an absence of IT principles (infrastructure refresh cycles, license policies, environment management etc.).
- Mission critical systems are dated and not vendor supported (e.g., SCADA, Energy Management System [EMS], work management [STORMS], fleet management [Fleetfocus]).
- The connectivity model is outdated and not synchronized between the steady state in and the operational state in the OMS and poses a liability and safety risk.
- Current processes do not utilize the capability of the OMS to capture ETRs because the outdated connectivity model and lack of accurate GIS data limit the accuracy of the ETR output.
- The capabilities provided by technology solutions are not fully leveraged or integrated (e.g., no integration between the automated meter reading system and outage management system to support the prediction of outage locations).
- The network infrastructure is dated and not supported. There is little telecom equipment integration present, which results in extended outages, possible equipment damage and risk to employees and the public.

- The controls in place to ensure identities and credentials are managed for authorized devices, users and processes across assets/locations are inconsistent.
- The disaster recovery site at Aguirre and the back-up control center (Ponce) do not support critical functions due to environmental and security risks.
- Current on-premises hardware is out of date.
- Compliance and governance software to adhere to North American Electric Reliability Corporation - Critical Infrastructure Protection (NERC-CIP) requirements[1].
- The IT OT department's ability to ensure secure business operations and deal with potential issues preemptively is severely limited due to:
  - End of life and non-maintained software and infrastructure assets
  - Immature IT OT asset management processes
  - A lack of IT OT asset management performance

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state business critical applications (i.e., hardware, software, databases and infrastructure) required to keep the business operating will be upgraded to vendor support level. The business-critical application and infrastructure portfolio will be vendor supported to mitigate the risk of prolonged system outages. In accordance with Act 17, maintaining vendor support mitigates operational risk to technology assets and business operations.

Backup control center and technology disaster recovery capabilities will be relocated to a secure and resilient facility. The facilities and technologies are critical to the resilience and continuity of technology services. In accordance with Act 17, the remediated state will ensure secure and reliable controls are in place to prevent and manage continuity of technology and business operations in the event of a disaster.

Enterprise architecture standards will be established along with the implementation of enterprise architecture capabilities within the organization.

Field mobile devices will be enrolled in the FirstNet First Responder system to improve response capabilities and resiliency by ensuring communications and access to systems, data and electrical network map during cellular connectivity disruptions.

LUMA's IT OT Asset Management procedures are compliant with the T&D OMA and ensure IT OT assets used to operate and maintain the T&D system are managed and maintained in accordance with Contract Standards by using strategies and risk optimization to achieve combined technical performance, life cycle cost, safety, customer satisfaction and regulatory compliance (T&D OMA Annex I, Section II(A)).

[1] Though Puerto Rico does not fall under the jurisdiction of NERC, LUMA opts to apply the appropriate sections of NERC to the extent they are reflective of industry best practices.

IT OT Asset Management

2.3 Description of Program Completed State

The IT OT Asset Management program addresses the major deficiencies in enterprise and operational technology asset management identified in the gap analysis. Included in the program are:

- Funds for replacement of end-of-life hardware, software, databases, and infrastructure assets to mitigate the risk of security breaches.
- Implementation of IT OT Asset Management, processes and practices.
- Implementation of a secure and reliable backup data center.
- Up to date cyber security systems and licenses for physical security monitoring.
- Up to date DNP3 compatible substation controllers for controlling the electrical grid and supporting grid modernization.

In the completed state, software, databases and infrastructure will be upgraded in accordance with vendor lifecycles or decommissioned when no longer required. The application and infrastructure portfolio will be vendor supported to mitigate the risk of security breaches. The backup data center facilities will be remediated to ensure resiliency and reliability of technology systems to enable business continuity and disaster recovery in the event of an incident or natural disaster. Recovery time objectives (RTOs) and recovery point objectives (RPOs) will be defined for business applications and will be supported. The IT OT Technology and Infrastructure team, along with the Technology Enablement and Sustainment team, will operate according to industry best practices. This includes conforming with established enterprise architecture standards and a technology refresh cycle, the implementation of enterprise architecture practices, and the ownership and operation of technology assets only within their useful lives.

The electrically connected model will be up to date and visible to Operations, giving them the ability to monitor, control and orchestrate field crews for emergency response and restoration efforts. Accuracy of the connected model is essential for public and worker safety.

2.4 Program Activities

There are 17 projects that comprise the overall IT OT Asset Management program.

The IT Application and Infrastructure Portfolio Optimization and IT Operational Systems projects represent the upgrade or replacement of enterprise and operational software applications as well as that of the underlying hardware or infrastructure to reach vendor supported levels. Where possible enterprise applications will be moved to cloud-based solutions and end of life hardware will be replaced. These programs will see upgrade/replacements begin in 2022, with most of the upgrades/replacements occurring by 2025.

The remaining expenditure addresses requirements to remediate inadequacies of the current backup data center. This remediation will help to ensure the resiliency and reliability of technology systems for business continuity and disaster recovery in the event of an incident or natural disaster.

Activities to achieve remediation include:

- Design the IT OT Technology and Infrastructure team and the Technology Enablement and Sustainment team based on leading technology industry standards.
- Define business critical systems.

- Recruit resources to operate and support business critical systems.
- Recruit enterprise architecture resources to define architectural standards and governance processes to ensure compliance with established standards.
- Develop upgrade/replacement plan to upgrade/replace software and infrastructure for business-critical applications.
- Complete upgrade/replacement projects for business-critical applications and substations.
- Assess available sites for backup data center and establish backup data center in recommended location.
- Relocate infrastructure supporting business critical applications to new backup data center location.

The following approach is required to ensure success and completion of the program:

- People
  - Develop a training and certification program for resources
- Process
  - Examine the application portfolio to develop a picture of long-term business and technical viability; establish a set of dispositions and criticality of action for transitioning the application portfolio (to cloud, for example, or for replacement)
  - Identify the sequence of actions that should be pursued to "remediate" the application portfolio, ensuring that actions are sequenced and right sized to optimize business value while minimizing the risk of application failure
  - Standup application environments to support development, testing, user acceptance testing, training, and disaster recovery testing
  - Develop processes and protocols to enable collaboration with field operations teams
  - Ensure proper training for support staff
- Tools and Technology
  - Define LUMA architecture standards and guiding principles
  - Use LUMA engineering standard for substation controller and RTU replacements
  - Extend the service management toolset to manage the application and infrastructure portfolio in accordance with the technology asset management strategy enabling lifecycle planning and supporting disaster recovery and business continuity planning
  - Establish a new backup data center and relocate all backup and disaster recovery infrastructure
  - Integrate siloed telecom management systems
  - Provide communication tools like cellular phones to field workers

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Indirect
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer**	☒ Deliver a Positive Customer Experience	Indirect

IT OT Asset Management

Primary Goals	Objectives	Direct or Indirect Impact
Satisfaction	☒ Increase Service Reliability	Direct
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☒ Improve Resilience of Vulnerable Infrastructure	Indirect
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

This program reduces the risk of safety-related incidents by maintaining applications and the underlying infrastructure that provides access to business-critical information including the electrical network.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

The program ensures customers have access to accurate and timely information provided by secure and reliable applications and infrastructure.

Objective: Increase Service Reliability

Replacement of end-of-life software, databases and other IT OT infrastructure assets will allow for better performance and monitoring of the O&M contract, improving reliability.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

The use of more secure and reliable enterprise and operational applications and their supporting infrastructure will enable more systematic management of the business. These will also help employees to operate systems more efficiently and effectively.

IT OT Asset Management

This program reduces the risk of prolonged outages of critical business applications by maintaining the systems and infrastructure at vendor supported levels.

PRIMARY GOAL: SYSTEM REBUILD AND RESILLENCY

Objective: Improve Resilience of Vulnerable Infrastructure

The program provides the necessary system upgrades to ensure secure business operation and continuity of the T&D system, as well as improved customer responsiveness.

2.6 Program Risks

The primary risk of not proceeding with this program is that applications and integration will become unstable and vulnerable to security breaches. This allows for critical customer and asset data to be compromised with the potential for significant financial penalties. Not proceeding with the program will lead to an increased risk of prolonged system outages and the need to invoke emergency and manual processes as defined in the LUMA Business Continuity Plan. These manual processes will negatively affect performance levels and increase the risk of human error. This will directly affect LUMA's reputation in the marketplace through an inability to respond to customer requests in a timely and appropriate manner.

We cannot immediately upgrade/replace all unsupported software and infrastructure for commencement day so there will be an ongoing risk until all software and infrastructure supporting GridCo business functions are upgraded or replaced and GenCo specific systems are no longer operating on the network.

Key identified hardware pieces are critical to the operation of the electrical grid. Failure of these will result losing control and visibility to the electrical network which can put employees and the public at risk. Equipment damage can also occur during this time. The same risks are applicable to incomplete map migrations of the OMS system.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$7.0**	**$2.8**	**$6.1**	**$14.5**
SRP Expenditures	$7.0	$2.8	$6.1	$5.6

3.2 Program Resource Requirements

- System integrators
- Software and infrastructure vendors
- Software solutions and required infrastructure
- Data center building
- Control System vendors and integrators

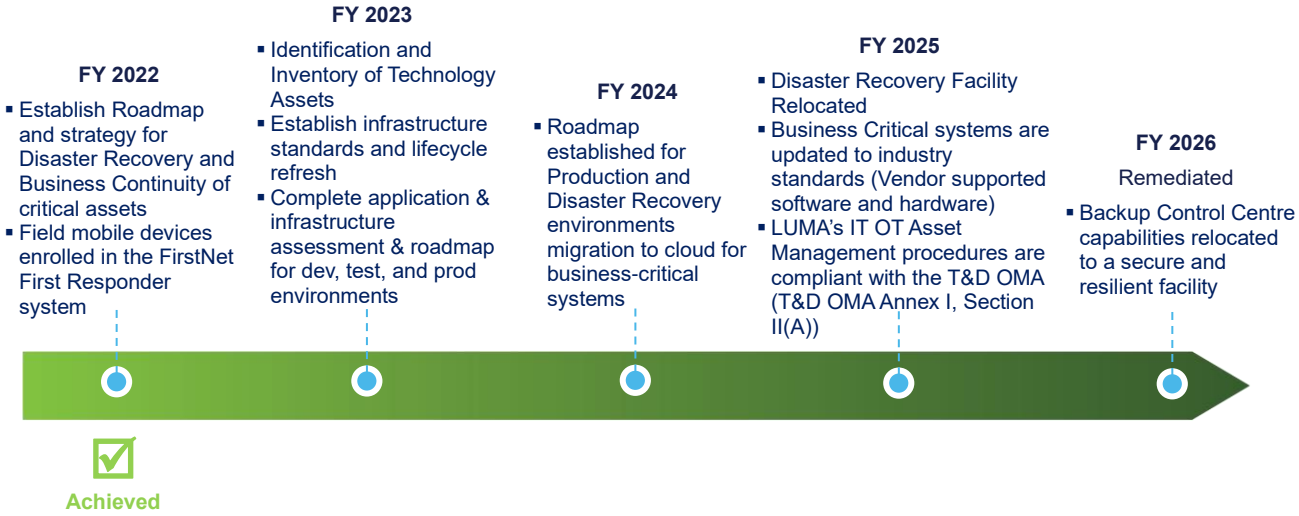
IT OT Asset Management

3.3 Estimating Methods & Assumptions

The costs associated with implementation of this program is estimated using the IBM Project Cost Estimator for the upgrading/replacing utility business applications and the supporting infrastructure, based on Gartner recognized industry leading solutions in the specific areas and the use of cloud-based solutions (when possible).

ITOPS estimation was done based on the 2020 FEMA documentation presented by PREPA.

3.4 SRP Program Timeline & Milestones



Update to Third Party Use, Audit, Contract and Billing Procedures

1.0 Program Description

This program is focused on updating procedures for third party use of land, use of infrastructure, audits, contracts, and billing. The program will include:

- Developing consistent processes and agreement templates to ensure compliance with legislation.
- Streamlining and improving customer service for third parties who wish to use pole infrastructure.
- Establishing annual billing to third parties to ensure they are paying the associated fee to attach to each individual structure (either overhead or underground).
- Completing updates and corrections to the CC&B system to ensure data accurately reflects the current asset management joint use attachment numbers and identifies responsible billing parties; and
- Implementing necessary changes to the billing process for joint use billing, which may include contract updates and renegotiation.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

PREPA has obligations to allow third party use of pole infrastructure in defined circumstances. Act 17, Arts. 1.5(9)(b); 1.15(a); and 1.17 and T&D OMA, Annex I, Section 2. A. 2. require a full inventory of pole attachments and a plan to add revenues for pole attachments.

Procedures and processes for requests to use the pole infrastructure are below minimum acceptable levels. LUMA's review indicates a lack of documentation for third party pole attachments.

The program will require working with operating groups who will complete an assessment of this infrastructure and as part of that process record data on existing pole attachments. From the data a full inventory will be created. The assessment process will include the review of adherence to loading standards to ensure resiliency of the system. This work will be coordinated with the distribution assessment program and GIS mapping. From this review and assessment process, the program will assist in creating agreements for existing pole attachments and to develop new procedures and agreement templates so that the reliability of the system can be maintained, and the work can be performed safely.

Identified gaps are as follows:

- Agreement templates are currently not available.
- Response times are inconsistent and often not reasonable.
- Procedures for installation by third parties are not consistently monitored and may result in unsafe installation or unplanned interruption in service.

- Lack of a permitting process for pole attachments has resulted in a high share of poles with attachments from third parties, resulting in physical loading of many distribution poles beyond prescribed limits. This increases the risk of structural failure of poles, reducing reliability and increasing public safety risk.
- Improper third-party pole attachments can block proper maintenance practices and increase safety risk to maintenance workers.
- Excess third party equipment not removed and unused, or obsolete equipment is often left attached to poles.
- Lack of clarity on obligation of third parties to provide payment for use of electric utility infrastructure. The systems and processes for tracking and updating joint use attachments are unclear or do not exist. Although PREPA has stated that they do bill for some joint use attachments today, data has not yet been provided.
- As noted in post-disaster reports, overloaded poles are more vulnerable to structural damage or failure in windstorm conditions. Restoration times are increased.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In accordance with requirements of Act 17 and the T&D OMA, in the remediated state all poles will have been inspected to properly document third party attachments. Any issues arising from third party attachments affecting pole integrity will be identified and a plan to remove or resolve an issue will have been developed.

Upon completion of the Remediated State, LUMA will have completed agreements for third party usage of poles in accordance with legislation. These agreements will clearly document standards required for third parties to attach to electrical infrastructure. Use of agreement templates will support consistency and efficiency, in a manner that is timely and meets the needs of the outside party. The templates will be used to enforce standards and requirements for the safe installation of third-party infrastructure on company land and structures and to clarify LUMA's obligations with respect to third party use of land and infrastructure.

Joint use billing is not part of the SRP. Updates to the joint use billing system will be achieved in the Completed State.

2.3 Description of Program Completed State

This program will be completed once the Remediated State has been reached and the additional joint use billing updates have been completed. All joint use attachments will be invoiced to third parties annually. LUMA will have completed updates and performed corrections in the CC&B system to ensure that data accurately reflects the current asset management joint use attachment numbers and the associated responsible billing parties. In addition, necessary changes to the billing process (as it relates to CC&B administration of joint use billing) will be updated, which may include contract updates and renegotiation.

In the completed state, there would only be exceptional existence of loading of distribution poles over prescribed structural limits. This would also include minimum interference with maintenance practices and

a low safety risk to maintenance workers and public. Minimal service interruptions would be caused by improperly installed third party attachments and/or structural failure due to overloading.

2.4 Program Activities

- Review the current legislation and establish communication with the regulating agency, finalize requirements within agreements.
- Develop agreement templates that are compliant with legal requirements and allow consistency of application with the outside parties.
- Establish, communicate and enforce agreements with third parties for use of electric infrastructure. This potentially includes payment for such use, as permitted by law and regulation.
- Analyze the current state of contracts related to pole attachments.
- Establish methodologies within the contract that define the responsibilities of the outside parties so that communication takes place and work can be monitored by Operations and be completed safely.
- Develop procedures for processing and managing requests received from third parties with defined timeframes to improve customer response times.
- Develop and implement procedures and practices in conjunction with pole replacement and rehabilitation programs.
- Asset Management will provide an audit list of joint use attachments and identify unsafe attachments.
- Customer Experience will update all joint use attachments into Oracle CC&B.
- Customer Experience will create annual billing cycle for third party partners.
- Complete updates and correct CC&B system billing data to ensure data accurately reflects the current asset management joint use attachment numbers.
- Make necessary changes to the billing process as it relates to CC&B administration of joint use billing to ensure effective and timely future updates.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct

Update to Third Party Use, Audit, Contract and Billing Procedures

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☒ Restore Damaged Grid Infrastructure	Direct
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☒ **Other**	☒ Other: Provide Additional Revenue	Direct

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace
Objective: Implement Effective Public Safety Practices

Decluttered poles make it much safer for employees as they climb them.

Standard form agreements that consider the work to be completed and the necessary communications with Operations will improve safety for both employees and the public.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience
Objective: Deliver Electricity at Reasonable Prices

Improved efficiency in responding to requests from outside parties will lead to improved customer experience and an improved image of the company within the business community in Puerto Rico.

Increased accuracy in third party customer billing. Potential for increased customer satisfaction as third-party customers will receive accurate billing.

Increased revenue from third party customer billing will put downward pressure on the overall revenue requirement thereby reducing electricity customer's rates. This involves a review of appropriate and justifiable rates with the advent of 5G technology.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Pursue Project Delivery Excellence
Objective: Enable Employees to Execute Operations Systematically

Increased visibility to third party attachments on structures will improve ability to complete planning activities.

The procedures to complete agreements with outside parties to comply with requirements to use existing poles will increase employee effectiveness and productivity by allowing employees to make decisions within established guidelines with clear standards.

Reduced process administration by eliminating manual tracking systems for joint use data.

Improved ability to query financial data related to joint use revenue will streamline processes for employees.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Restore Damaged Grid Infrastructure

This program helps to repair damage to pole integrity caused by the current system for managing third party attachments.

Objective: Improve Resilience of Vulnerable Infrastructure

New processes with enforceable contracts and standards will control the proliferation of third party attachments and make sure they are safe and do not harm pole integrity.

PRIMARY GOAL: OTHER

Objective: Provide Additional Revenue

Potential annual revenue generated from up-to-date joint use attachments billing. The table below details breakdown of revenue generated.

Attachment Type	# of Assets	% of Joint Use (~75%)	% of Unbilled (~25%)	Annual Attachment Fee	Annual Revenue
Overhead	~334,000	~250,000	~60,000	$15	~$900,000
Underground	~100,000	~75,000	~20,000	$5	~$100,000
				Total	**$1,000,000**

2.6 Program Risks

The risk in not proceeding with the program is to continue with the present system, which is inadequate. The current system will result in compromising the pole structures and potential unsafe installations, which could result in unplanned service outages on the system. The current system has led to poor relations in the business community and has contributed to a level of mistrust between the public and the company. Not pursuing this program will also result in lost attachment revenue and non-compliance with regulator.

The risk in proceeding with the program is that it will represent a marked change from past practices. A customer service-oriented approach will have to be established to be effective. There are potential

stakeholder management issues that may arise if joint use billing significantly increases for attached third parties that may require escalation management.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$5.8**	**$3.6**	**$3.6**	**$25.5**
SRP Expenditure	$2.8	$1.0	$1.0	—

3.2 Program Resource Requirements

- Technical writing resources will be required to aid in developing and writing the detailed procedures for pole attachments
- Legal resources will be required to develop the template agreements
- Customer experience resources to perform billing updates and assist in reporting progress and development of process and procedure updates
- Third party billing information including billing address, contact information and contract terms
- Post audit up to date asset data extract from asset management system (GIS) including structure type, location and attached third party company name
- Field inspectors are needed to inspect the locations that are being requested to be attached
- Engineering analysts are needed to properly perform pole loading and sag analysis that
- A portal needs to be created to properly process and document the applications
- Integration with various databases (G-electric, Asset Suite, etc.) are needed to keep pole data up to date

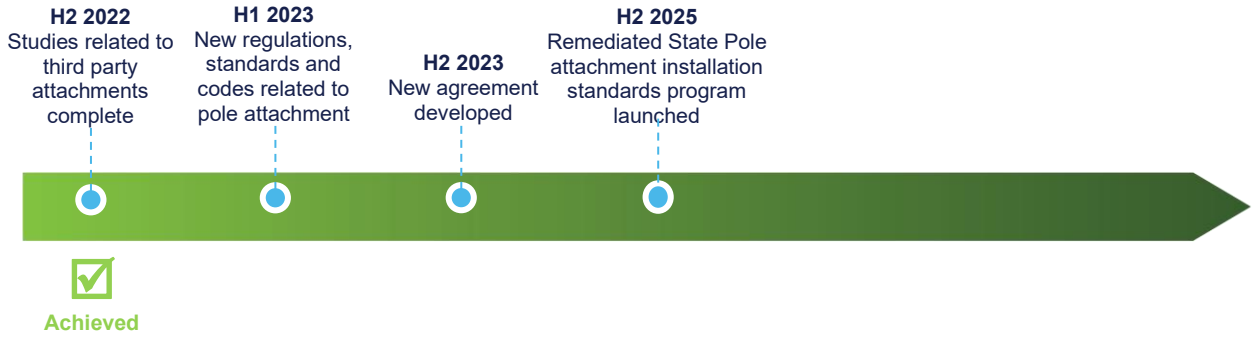
3.3 Estimating Methods & Assumptions

Standard LUMA pay scales assumed for internal resources and previous benchmarking of external resources such as contractors and legal assumed.

Methods and assumptions used to develop the joint use billing update program estimate include the following:

- Estimated $15.00 annually per overhead attachment
- Estimated $5.00 annually per underground attachment
- Joint use data has not been updated or billed accurately in some time which will result in increased revenue post audit
- Estimated 75% of overhead structures have joint use attachments
- Estimated number of pedestals based on 3,005 pad mount transformers
- No overtime required
- PREPA is not billing fees for unauthorized attachments

3.4 SRP Program Timeline & Milestones



IT OT Cybersecurity Program

1.0 Program Description

This program focuses on the establishment of a cybersecurity program that protects key organizational assets including people, resources and technology. The program will ensure that cyber risk, internal and external threats, vulnerabilities and natural disasters are identified and mitigated based on risk and readiness factors. Improving cybersecurity is a critical part of hardening the T&D System and PREPA business continuity. Cyber risks could severely affect T&D System operations potentially even to the point of widespread failure. The program will design and implement the people, processes and technologies essential for effective cybersecurity governance, cybersecurity operations and monitoring, vulnerability identification and management, and cloud security.

Key to this program is the ability to defend against cyber incidents. A cyber incident is an event that has a negative impact on the organization. This includes but is not limited to data breaches, damage to systems (physical or digital), loss of system control or operations, lack of confidence in or accuracy of data, ransomware, phishing, theft, natural disaster (loss of ability to operate), equipment/system failure and unauthorized access. By ensuring the confidentiality, integrity and availability of assets in compliance with Section 13 of the T&D OMA, the cybersecurity program will proactively mitigate risk and enable business operations by identifying and reducing the risk and impact of a cybersecurity incident to the organization.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

REDACTED

REDACTED

IT OT Cybersecurity Program

REDACTED

2.1.1 Additional Gaps Identified Post Commencement

REDACTED

2.2 Description of Remediated State

REDACTED

IT OT Cybersecurity Program

[redacted]



2.3 Description of Program Completed State

REDACTED

[redacted]

IT OT Cybersecurity Program

[redacted]

2.4 Program Activities

[redacted]

2.4.1 Additional Activities Identified Post-Commencement

REDACTED

2.5 Program Benefits

REDACTED		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

IT OT Cybersecurity Program

REDACTED		

FY 2023

IT OT Cybersecurity Program

[redacted]

2.6 Program Risks

REDACTED

[redacted]

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$3.7**	**$5.0**	**$5.7**	**$57.8**
SRP Expenditures	$3.7	$5.0	—	—

3.2 Program Resource Requirements

Staff augmentation to manage and operate the Information Security Office and Cybersecurity program has been included in the OpEx budget estimate. Contracted resources to implement the projects and program are included in the CapEx estimate.

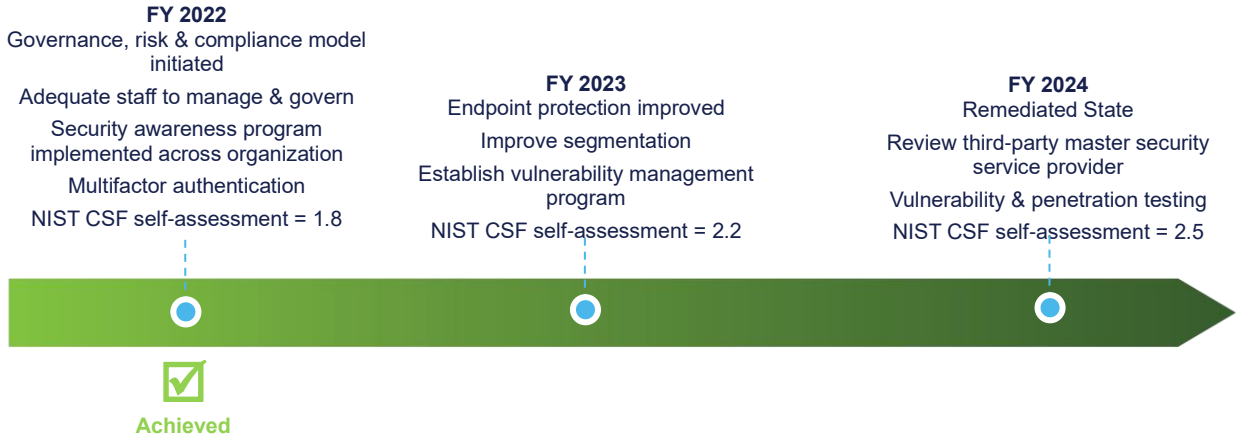
3.3 Estimating Methods & Assumptions

- Contract or internal resources

IT OT Cybersecurity Program

  - Licensing and implementation costs
  - Rates/hour or FTEs and hours assumed
- In-service date (lifecycle refresh dates — industry best practice)
- Historical program information
  - Experience/knowledge

3.4 SRP Program Timeline & Milestones



4.0 Abbreviations

CIA Triad	Confidentiality, Integrity, Availability Triad
IAM	Identity and Access Management
IT	Information Technology
KPI	Key Performance Indicator
MSSP	Managed Security Service Provider
NERC-CIP	North American Electric Reliability Corporation – Critical Infrastructure Protection
NIST	National Institute of Standards and Technology
NIST CSF	NIST Cybersecurity Framework
OT	Operational Technology
PAM	Privileged Access Management
PLC	Programmable Logic Controller
RACI	Responsible, Accountable, Contributor, Informed
RPO	Recovery Point Objectives
RTO	Recovery Time Objectives
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SIEM	Security Information and Event Management
SLA	Service Level Agreement

IT OT Enablement Program

1.0 Program Description

This program will implement capabilities to deliver and maintain IT OT services and systems enabling LUMA operations through the implementation of industry best practices and standardized processes and tools.

Fit for purpose devices will be deployed to carry out business operations enabling near real-time access to electric network data, providing a safer work environment.

Industry best practices for ITSM will be implemented so that technology assets are managed, provisioned and maintained securely. Processes will be implemented to establish end user device standards along with MAM to control how end user devices are used.

EA and project management frameworks will be implemented to ensure software and infrastructure assets are implemented, maintained and disposed of in accordance with vendor support requirements including patching and upgrades. This will mitigate the risk of prolonged system outages on non-vendor supported software and infrastructure.

By the end of the program LUMA will have developed and executed an operational data strategy, developed foundational enterprise architecture guidance, and outlined a cloud strategy. LUMA's IT and OT organization will be able to design, plan, deliver, operate, and control the lifecycle of IT and OT services, projects, and assets. An ITSM tool will ensure that technology is managed, provisioned and maintained securely to reduce risk to the organization and enable users.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA is charged with:

- Overall management of approximately 4,000 users with access to enterprise and operational systems
- Management of end user devices ranging from mobile phones to tablets, desktops and peripherals distributed across Puerto Rico
- Management of business projects that introduce, extend and maintain technology assets

The current state of service management, project management and enterprise architecture processes and the maintenance of end user devices corresponds to a low maturity score based on LUMA's gap assessment. This indicates that PREPA is aware of the need to address the elements that define a competent IT OT service organization and end user device program and is starting to apply them in specific areas of ITSM.

Gaps requiring attention exist in all areas of service management, for example:

IT OT Enablement Program

- There are no formal documented service management processes aligned to an industry framework for the management of incidents, problems, request fulfillment and performance.
- There are no certified service management professionals within the PREPA organization nor is there a training and development plan in place to achieve certification.
- There is no established IT OT service catalogue, associated service levels, services, prioritization or escalation mechanism for IT OT services. Incidents are responded to on a “first come, first served” basis without analysis of risk level to the organization.
- PREPA is using a project defect management tool in an attempt to manage the core capabilities of ITSM, which are request fulfillment and incident, problem, and performance management processes. As this is not the vendor’s intended use of the tool the capabilities are limited. The tracking of requests, incidents and problems is simply through lists with no workflow or analytics.
- There is no centralized repository for tracking and managing end user devices, software and infrastructure.
- Resource constraints within the IT OT team have resulted in a lack of capacity to conduct analyses on incidents or to develop improvement plans.
- Current PREPA systems do not comply with an end user device refresh practice resulting in end-of-life devices that present a clear cybersecurity risk. The use of such devices would negatively affect LUMA’s operations, regulatory compliance, employee safety and customer satisfaction.
- End user device security patching processes and practices require significant improvement.
- PREPA has an immature data management strategy — a Proof of Concept (PoC) is underway on data lake and analytics (which are covered in other initiatives), but there are no actions underway or planned with respect to operational data. This initiative is intended to address that shortfall, articulating a first set of policies / principles concerned with critical data subjects, defining: critical data subjects' ownership / custodianship, definitive persistent stores (Books-of-Record) rules of consumption, replication, persistence data sensitivity, protection, integrity and availability rules / standards.
- PREPA has very limited architectural capability — this initiative will introduce foundational artefacts / capabilities: enterprise architectural mandate operating model (governance, interactions), foundational models (e.g., Component Business Model [CBM]) and foundational building code for the implementation of a tool.
- There is no integrated software development or implementation lifecycle methodology; nor is there a project initiation, prioritization, approval and funding process. There is also limited project planning, scheduling, execution and closeout processes or standardized tools and templates for each project phase. The gap assessment also indicated a lack of standards for project document storage, folder organization, naming convention or defined lessons learned process nor integration of lessons learned into future project planning.
- Project management methodologies are not integrated with business relationship management, enterprise architecture and technology.

As a whole, the IT OT department’s ability to support and enable business operations in a secure manner has been hampered by end of life and poorly maintained end user devices, immature service management processes, lack of properly skilled / trained personnel, lack of transparency on service management performance and the lack of an enterprise architectural and data management strategy.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

IT OT Enablement Program

2.2 Description of Remediated State

In the remediated state LUMA end user device standards and tools for device imaging and management will have been implemented. All end user devices deemed end of life will have been replaced. Information architecture will have been strengthened and service management processes, practices and tools will have been implemented.

2.3 Description of Program Completed State

The IT OT Enablement program addresses major deficiencies in the End User Device Management and Technology Operations Practices that were identified through LUMA's gap assessment. This program includes:

- Replacement of end-of-life end user devices, thus mitigating the risk of security breaches
- Implementation of service management certification standards
- Implementation of service management processes and practices
- Implementation of a service management tool to support improved request fulfillment, incident, problem and performance management
- Implementation of project management certification standards
- Implementation of project management processes, practices tools and templates across the service delivery lifecycle

In the program completed state, end user devices will be maintained and refreshed on a schedule set by the IT OT Service Management group according to industry best practices. This includes conformance with Information Technology service management standards, regular patching and refreshing of end user devices, full training for all service management personnel, implementation of service management practices and owning end user device assets that operate within their useful lives.

2.4 Program Activities

There are 21 projects that comprise the overall IT OT Enablement program.

The largest project is for capital acquisition of new end user devices to replace those that are end of life and unsecured. This includes approximately 2,000 laptops, 550 desktops, 1,200 ruggedized tablets and 2,300 mobile devices that need to be replaced. This project aims for device refresh to occur during 2022 and early 2023. We estimate that $4.3 million over the two years is needed to complete the refresh of devices.

The other major expenditure addresses the requirement to implement an industry standard IT OT service management toolset to manage all service requests including:

- User access
- Software
- End user device
- Hardware and peripherals
- Information Architecture
- Architectural Strengthening

IT OT Enablement Program

Additionally, the IT OT service management toolset will record and manage incidents, problems and performance across these areas.

The resulting program will encompass the people, processes and technology required to ensure the success of the comprehensive program.

PEOPLE

- Design the IT OT Service Management group based on leading industry service management standards
- Develop a training and certification program for resources
- Design an Enterprise Architecture strategy that formalizes leading technology resource interactions

PROCESS

- Develop IT OT Service Management Catalogue and associated service levels based on leading industry IT service management standards
- Develop level three business process models and standard operating procedures for request fulfillment, incident management, problem management and performance management
- Develop end user device asset management strategy including refresh period and patch management process
- Develops and operationalizes a critical IT capability concerned with strategic leadership of technology
- Develop standardized project management processes including project deliverable set based on the project type and project phase

TOOLS & TECHNOLOGY

- Define LUMA end user managed device standards (including provisioning, securing, and imaging) and user profiles
- Evaluate and implement recommended service management toolset with core configuration service management toolset based on the IT OT Service Management Catalogue and service levels enabling service level reporting and data driven decision making
- Extend the service management toolset to manage LUMA end user devices in accordance with the end user device asset management strategy
- Establishes the Building Code as the basis by which technology work will be conducted
- Establish project deliverable templates

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Indirect
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer**	☒ Deliver a Positive Customer Experience	Indirect

IT OT Enablement Program

Primary Goals	Objectives	Direct or Indirect Impact
Satisfaction	☒ Increase Service Reliability	Indirect
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Reduce risk of safety-related incidents by providing access to electrical network data via functioning and secured end user devices, and by resolving business critical application and infrastructure incidents on a priority basis.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Enable the field workforce access to the electrical network and customer request data.

Objective: Increase Service Reliability

Eliminate manual work orders reducing the time to respond to network outages.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Use of secure end user devices will enable more systematic business management.

IT OT Enablement Program

Provides standards and associated governance for LUMA's most important technology commodity: operational data. This ensures that critical operational data features managed with integrity, and that owners / custodians own key decision-making.

Objective: Enable Employees to Execute Operations Systematically

Since employees will have access to more functional end user devices, they will be better positioned to systematically execute operations.

2.6 Program Risks

The primary risk of not proceeding with this program is the continued access to the IT OT networks by unsecured devices and the increased risk of a cybersecurity attack. This represents a significant risk of breach of customer and/or corporate data.

We cannot immediately suspend the use of all end of life end user devices so there will be an ongoing risk until all end user devices used by LUMA are refreshed and devices used by the Generation Company (GenCo) and any other users are removed from the network. This includes both a cybersecurity risk due to outdated security standards of the end of life devices, and an operational risk since the continued use of end of life devices may result in operational delays and difficulties.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$2.6**	**$3.1**	**$3.7**	**$3.0**
SRP Expenditure	$2.6	$3.1	$3.7	—

3.2 Program Resource Requirements

- ITSM Tool system integrator
- End user devices
- Enterprise architectural strengthening and data management

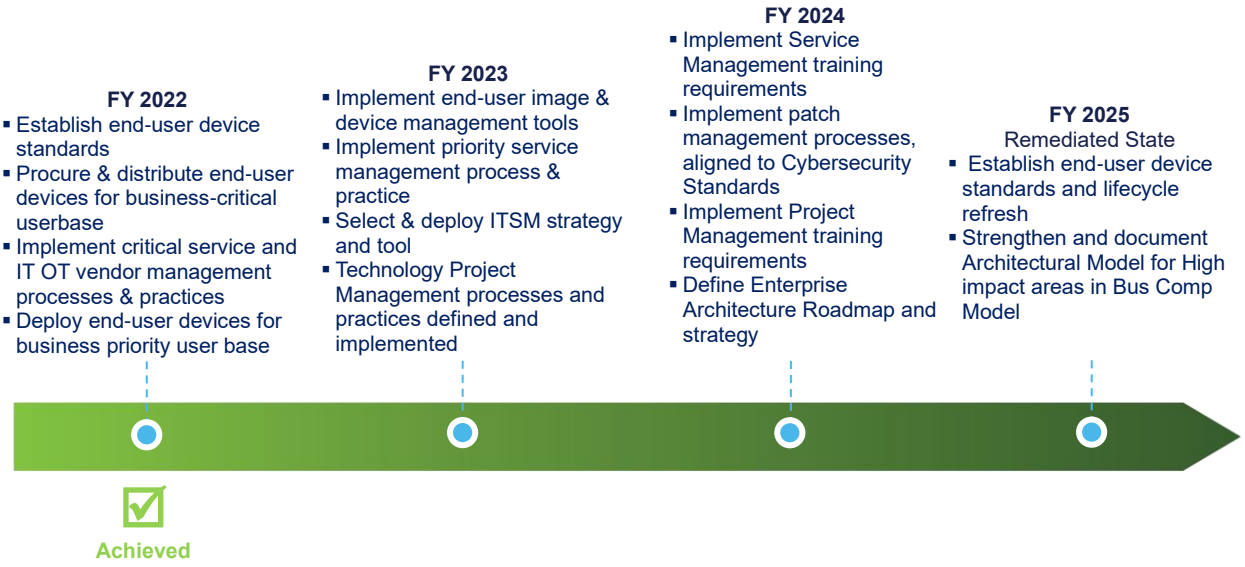
3.3 Estimating Methods & Assumptions

The end user device replacement project, which represents the bulk of this program, is estimated based on quotes from various service providers available within Puerto Rico and the mainland United States.

The costs associated with the implementation of service management processes and tools is estimated using the IBM Project Cost Estimator for implementing a Gartner recognized industry leading ITSM solution. Pricing assumptions are based on the implementation of ServiceNow for a medium-large sized enterprise.

IT OT Enablement Program

3.4 SRP Program Timeline & Milestones



Critical Financial Systems

1.0 Program Description

This program covers the technology projects for Finance and Facilities, including financial management systems and technology, risk management systems and supply chain management technology. The initiatives cover areas within budgeting, reporting, consolidation, risk management, time tracking, employee expenses, fixed asset subledger, procurement, and a major life cycle upgrade for the Oracle EBS system. These initiatives are required to maintain a supported version of the financial applications or to address gaps identified in the financial management area.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Gap assessments have identified several gaps that impact the ability to produce accurate and timely financial results. Such financial results are required to meet an independent audit or management certification standard, provide data to support key business decisions, automate processes to lessen manual risk of fraud and error and track and report on enterprise risks. The specific gaps identified were as follows.

A. TIME MANAGEMENT:

- Total hours worked by employees are recorded using biometrics; however, the time tracking or costing component is disconnected from that data. This means that timecard data which is manually collected could have variances from the actual biometric time. To ensure that any variances do not cause an overall misstatement, the actual timecard data is calculated into percentages that is applied to actual pay. This is a significant gap where there is a requirement to cost actual hours worked that are traceable to a timecard such as FEMA-funded or non-federally funded capital projects.
- Current systems have not been developed to track time for project tracking using a work breakdown structure. The existing tool does not have project task structures available to record time against.

B. EMPLOYEE EXPENSE REIMBURSEMENT:

- The current process is manual and relies on manual review and approvals which exposes the organization to fraud and human error that could be reduced with the use of automation.
- The current process does not allow for the costing of expenses to a project or work break down structure.
- There is no tool to support the use of corporate purchase cards which could be used to streamline small purchases.

Oracle has an expense module that would support automated approvals, charging to projects and the use of corporate purchase cards.

Critical Financial Systems

C. PROCUREMENT:

- Currently, there are two systems used for procurement; Oracle EBS for purchases under $5,000 and Asset Suite for purchases over $5,000. The use of two separate systems for procurement does not allow for optimal contract and process management.
- Asset Suite has not been developed to support the use of a project work breakdown structure which represents significant gaps in the ability to manage projects.
- Asset Suite has not been integrated into Oracle Financial in a way that would record commitments to projects. The ability to review committed costs against projects provides the project manager with valuable information that helps to forecast cashflow and track progress toward completion and against budget. This would currently have to be done manually with a report from Asset Suite.

D. PROJECT COST CONTROL

- The Oracle Project Accounting module that is used to collect costs in the financial system is not integrated with any project management, cost management, or scheduling tools. As a result, Oracle Project Accounting is unable to provide project managers with the necessary information to monitor, analyze, or forecast costs on large scale projects.

E. FIXED ASSETS

- A system upgrade of the fixed asset module, which tracks the asset base and depreciation amounts, was improperly performed a few years ago and never completely remediated. This affected the ability to record retirement transactions in the system and forced manual entries to be done in the General Ledger. This issue means that the fixed asset subledger does not have the correct asset balances and therefore does not correctly calculate depreciation. This has been an issue on many audits and will take a substantial amount of time and effort to resolve both the system issue as well as the recording of all top side entries into the fixed asset subledger. The overall recording and maintenance of asset data will be assessed as part of the asset management initiative included in the IT/OT area.

F. BUDGETING & FORECASTING

- The budgeting system used for producing operation and maintenance budgets needs some enhancements to close the gaps in the overall budgeting process. The review of budgets and the tracking of those budgets to actuals provide organization controls on expenditures and highlight areas of concern. The system and the processes supporting this process must have controls around approvals and the ability to have a monthly amount projected accurately to compare to actual costs.

G. REPORTING & CONSOLIDATION

- The use of a consolidation and financial reporting tool. This tool will provide three primary benefits 1) automation of the current manual financial reporting process which is prone to error, 2) support PREPA going from a one organization enterprise to multiple entities which will require consolidation and further complicate reporting, and 3) provide automated linkage to an enhanced forecasting tool.

H. OPERATIONAL REPORTING

- Financial data is important to business decisions and there is currently no ad hoc reporting tool in place. This requires that every request for data either be manually created in excel or an Oracle custom report created. The use of custom reports for ad hoc data analysis is not efficient from a cost

or effort perspective. PREPA has started this project to bring data into a data lake for analysis. This reporting tool would enhance work on this project for the Finance area.

I. RISK MANAGEMENT

- There is an identified gap due to the lack of risk management software which would ensure that enterprise risks are identified, exposure data is properly accumulated and tracked and that claims data is captured and monitored through to claim closure. This system would also be utilized by the Health, Safety and Environment (HSE) department to record near misses, analyze trends in claims and record other vital safety information.

J. FACILITIES MANAGEMENT

- There are a couple of gaps identified in the management of our facilities; including the lack of software to accurately project costs related to building upgrades. This will be a major area of focus in the coming years.

K. GENERAL TECHNOLOGY

- Meeting rooms need to have technology installed to allow for collaboration and sharing.

2.1.1 Additional Gaps Identified Post-commencement

No additional gaps identified at this time.

2.2 Description of Remediated State

Five gaps noted in Section 2.1 are identified as needing remediation. Gaps are remediated when the following is achieved:

- Time can be recorded to projects and task structures once and will be accurate and traceable to an approved timecard and fully integrated with payroll and project costing which will meet the requirement for FEMA funding and our standard for Non-federally funded projects. (gap A)
- Employee expenses can be recorded to a project and task structure. (gap B)
- Procurement can record cost of materials and services to a project and task structure. (gap C)
- Fixed asset subledger will reflect correct balances and produce correct depreciation amounts for financial statements. (gap E)
- Risk management exposures and the ability to manage insurance claims will be captured in the software database. (gap I)

2.3 Description of Program Completed State

Items included in this section have been identified as gaps and require work to bring the program to a completed state. Once the gaps have been addressed the following should have be achieved:

- Employee expenses and per diems will be approved using automation and the roll out of corporate purchase cards will be complete.
- Procurement and contract management processes have been consolidated into one system and one process supporting the organization.
- Oracle project accounting, project management, cost management and scheduling are fully integrated providing a robust project support system for the large capital programs required.

Critical Financial Systems

- Budgets will be relied upon by the organization for tracking and control of actual expenditures.
- A reporting and consolidation tool will be in place allowing the organization to meet reporting requirements and consolidate multiple organizations.
- An ad hoc reporting tool will be available to support analysis of financial transactions for audit, decision making and regulatory filings.
- Estimating software is in place to support the major facilities work that is required with accurate forecasts and tracking of progress.
- Meeting rooms are equipped to support collaboration and communication.
- Financial application will be upgraded as required to maintain vendor support and to take advantage of new functionality releases.

2.4 Program Activities

- A new time tracking system needs to be implemented that is tied to biometric data that allows users to charge hours directly to activities and allows users to charge to project and task structures as required.
- Either changes will be completed in Asset Suite to allow costs to be recorded to project and task structures as required or major project procurement will be moved to Oracle EBS.
- Either changes to the existing process for employee expenses which allows the coding to project and task structures as required or the implementation of Oracle Expenses is completed.
- A team (yet to be determined if this is a PREPA, LUMA or other party task) will be created to develop a capitalization policy, assess and correct the fixed asset broken functionality and then to review all manual top side entries and book their impact into the subledger.
- A new software system will be implemented to track insurance exposure data, insurance claims data and safety data components.
- Evaluate asset suite and Oracle procurement systems for best fit and consolidate processes into one system.
- Work with the PMO office on the implementation of a project management tool that is integrated with financial data from Oracle.
- A project team will review and identify changes to be made to the existing budgeting system to resolve gaps identified. An external consultant will be engaged to make changes to the system, complete testing and roll out.
- Implement a consolidation and financial reporting tool.
- Finance will support the larger project to move financial data into a data lake for ad hoc reporting.
- New estimating software for building will be implemented.
- New meeting room technology will be installed.
- Team will be formed to review, test and implement a major Oracle upgrade.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	

Critical Financial Systems

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☒ Enable the Digital Transformation	Direct
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

- Financial statements can be produced timely and accurately in accordance with Generally Accepted Accounting Principles.
- Business users will have the ability to access financial data for analysis to support business decisions.
- Risks will be logged, reviewed and measured for impact on the business.
- Budgets will reflect expected results and provide tracking and control of the business.
- Results in the fixed asset module can be relied on for timely analysis and accurate depreciation amounts.
- Project managers will have detailed cost information allowing them to identify root causes of budget variances and improve cost forecasting.

Objective: Pursue Project Delivery Excellence

- The ability to track detailed hours for activities performed and enforce timecard approvals.
- Provide detail labor costing for FEMA and non-federally funded projects without large amounts of manual effort.
- The use of an estimating tool for buildings will allow for better execution of a large capital program.

Objective: Enable Employees to Execute Operations Systematically

Critical Financial Systems

- The automation of employee expenses will ensure system enforced approvals and timely transfer of data through the process.
- The use of procurement cards will streamline the process for employees who need small materials or supplies.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

- Accurate recording of time is required for Federal Funding.
- Deployment of building estimating software will support the spending of Federal Funded dollars on buildings.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Enable the Digital Transformation

Since this program is made up of technology related projects most areas will contribute to enabling digital transformation. The automation of time tracking and cost tracking, including employee expenses, would be heavy in this area.

2.6 Program Risks

The risks without the execution of this program would be a material misstatement of financial results and the loss of federal funding. Inaccurate financial results could lead to bad business decisions, materially misinform internal and external stakeholders and damage the reputation of LUMA. Inaccurate labor reporting and job costing could ultimately lead to unexpected budget variances and potentially losing eligibility for federal funding.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$2.6**	**$3.2**	**$1.3**	**$6.5**
SRP Expenditures	$2.4	$0.7	$0.4	$0.1

3.2 Program Resource Requirements

Costs related to this program include internal labor, external IT resources and consulting support for specialized areas.

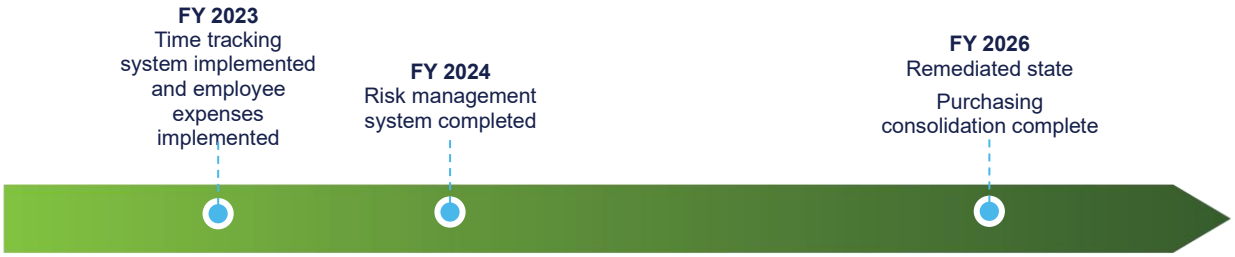
3.3 Estimating Methods & Assumptions

Each project was estimated individually based on the expected resource requirements. Resources and the hours of effort were costed at average labor rates.

Critical Financial Systems

3.4 SRP Program Timeline & Milestones

Each project within the program will have its own timeline and milestones based on a project plan. Depending on funding availability, the entire program is estimated to be completed over 5 years. The items requiring remediation will be complete by the end of 2026.



Critical Financial Controls

1.0 Program Description

The Critical Financial Controls program focuses on two key areas, internal control and internal audit. These two areas will build skills and capabilities in financial reporting and audit; and will update and enforce industry standard policies and procedures that comply with the latest laws and regulations. Internal Controls will address various internal control items, including obtaining and reviewing service organization controls for major vendors, the implementation of key transaction controls, reconciliations, validation, physical inspections, documentation evidencing performance of control tasks, disclosures, enforcement of applicable policies and procedures for employees to identify deviations, the establishment of a formal plan for communications with the audit committee and the revamp of the internal audit department. Internal Audit builds the foundation of the internal audit team as well as the development of the methodology and process, along with building and retaining the required skills and technology base.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

In the review of current processes and controls a list of 63 critical SRP gaps were identified. These gaps covered multiple areas and were summarized into key areas of findings:

- Accounting policies
- Approval controls
- Physical asset reviews
- Reconciliation and review
- System enforced controls
- Timely recording of transaction and accruals
- Evidence of review and approvals
- System access & segregation of duties
- Budgeting processes
- Accuracy of subledgers
- Customer service policies
- Recording of cash
- Control over master data & reports

To have a control environment which mitigates the risk of material misstatement of the financial statements, provides for the reporting of consistently reliable financial information, provides reasonable assurance that transactions are properly processed without error, and assists in the mitigation or detection of fraud, these control gaps need to be remediated.

Overall, the analysis confirmed a lack of clarity regarding roles and responsibilities which has led to an ineffective financial decision-making process. Much more clarity is required on roles and responsibilities related to financial transactions, reconciliations, validation, physical inspection and disclosure steps. This includes complex decisions that require judgement.

Critical Financial Controls

Enforcement of policies and procedures, as well as employee training in policies and procedures, is greatly lacking. Both training and enforcement are critical to identify deviations and root causes, to assess impact, and to determine corrective actions in key areas such as cash, procurement, capital assets, revenue & account receivables, accruals and inventory.

There is a need to identify and document key areas of focus and to mitigate risks of significant changes in business, system and overall processes or fraud.

Follow up on deficiencies and other matters identified internally and/or by external auditors is not prompt. Finally, there is a lack of documentation of key findings and corrective actions taken to address those.

The existing financial management and reporting processes and procedures are inadequate to manage the complex business of running an electric utility. There will therefore be a need to review, update, remediate and implement new policies and procedures to ensure controls are in place and operating as needed. This will provide reasonable assurance that risks are mitigated and help to ensure accurate and complete closing of accounting records, financial statements and reporting on deliverables.

The Audit department requires an increase in overall skills and capabilities. There is no formal assessment of the Internal Control Framework. In addition, the existing internal audit procedures appear in need of updating to effectively manage and control the risks associated with the high capital and operating costs of a large utility company.

Gap assessments of the existing financial management procedures and policies have identified there are significant problems and inconsistencies in how the system has been managed. Any deviations from expected answers in the annual ethics certification process in the work environment and workplace are not properly followed up on for compliance. Current policies and procedures must be routinely examined to ensure they comply with the latest laws and regulations. Additionally, these policies and procedures need to be aligned with the latest technology and the latest thinking in the industry to increase their consistency and effectiveness.

The employee skill levels needed to properly execute policies and procedures that are required for the financial management systems are not fully available, and PREPA lacks the internal controls to assess effectiveness. Currently there is no process in place to obtain and review specific organization controls for services provided by major outsourced vendors as well as the review of the interface of those to the Oracle EBS system.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

Items included in this section have been identified as significantly below operating practice and requiring remediation (dates are contingent upon available funding for resources to remediate) prior to the transfer of liability. Once the gaps have been remediated the following should have been achieved:

- All 63 of the identified internal control gaps discussed above have been remediated.
- Policies and procedures exist and are reviewed for updates and all employees and contractors are knowledgeable of relevant policies and have access to a current "Administrative Manual".

Critical Financial Controls

- Policies and procedures are in place to ensure key risks are mitigated and accurate and complete closing of accounting records, financial statements and reporting on deliverables are achieved.
- Transparency and necessary skills on key financial roles and responsibilities with employees able to identify deviations, assess the impact, and take appropriate actions to ensure compliance with laws and regulations.
- Basic skills and consistent application of industry standards for financial tasks and decisions that are complex and require a high level of judgment.
- Consistent information and communication across the organization supports a forward-looking and solution-oriented audit approach.
- Establishment of more frequent and fluid audit cycles on key areas of focus, and review of the Internal Control Framework.

2.3 Description of Program Completed State

Internal Controls addresses the major deficiencies identified as part of the assessment of internal controls over financial reporting, such as review, update, and enforcement of applicable policies and procedures; review of external contractors for compliance; and assessment of skill and capabilities. In the completed state, the Finance department will have policies and procedures updated to comply with laws and regulations, relevant to the latest technology, and industry best practices. They would be regularly reviewed for consistent and effective approach, which will help to identify and address the necessary continuing development of skills and capabilities, support strong internal controls, and ensure accountability and consistency in daily transactions and financial reporting.

In the completed state, financial errors or omissions, material weaknesses and significant deficiencies will be mostly avoided by the presence of sound controls.

Revamping Internal Audit addresses the need for building the foundation for the internal audit team and subsequently retaining the skills and technology required. In the completed state, more frequent and fluid audit cycles will be established on key areas of focus, such as legal and compliance, finance, federal and non-federal procurement, payroll, and operations. Also, the new policies and procedures established by this program will require prompt communications across the Audit Committee, Finance/Operations departments, and external auditors.

The completed state will also include a routine process whereby audit findings will be discussed with management of the audited department, followed by required formal remediation actions. The completed state will include follow-up audits by the internal audit department to verify remediation actions have been completed.

There will be a link between strategic objectives and the risk assessments of the Finance and Operations groups, who must mitigate, monitor, and report on risks associated with their day-to-day activities. Understanding how the business works and its major objectives, will help them to establish a clear link from those objectives to the information they collect and the controls they establish to mitigate risks. This approach also gives risk management personnel the ability to aggregate, visualize, and assess data consistently, since all risks will be related to the same corporate objectives.

Critical Financial Controls

2.4 Program Activities

- Monitor and address deviations on ethical values and compliance. Corroborate common ethics challenges and establish a compliance process to follow up on deviations.
- Obtain service organization control reports from a major vendor. This is a PUP and provides assurance of control objectives and improves the strength of internal controls.
- Link risk management from top to bottom. Create a framework to ensure alignment between corporate objectives and the risk assessments of the finance and operations groups.
- Develop processes needed to ensure policies and procedures exist and are reviewed for updates, and to communicate and ensure that all employees and contractors are knowledgeable of relevant policies and have access to a current "Administrative Manual".
- Develop and implement an industry standard approach and identify the necessary skills for financial tasks or decisions that are complex and require a high level of judgment.
- Define and implement key roles and responsibilities so employees can identify deviations, assess the impact, and take appropriate actions to ensure compliance with laws and regulations.
- Establish a formal plan for Internal Audit to communicate any deficiencies to executive management and the Audit Committee. Deficiencies may be identified internally or by external auditors. The plan will describe actions to be taken to assess the root cause and dependencies, along with the remediation plan.
- Implement standard business planning processes for budgeting, which need training and support.
- Addressing and training people on any interdependencies on the design and effectiveness of internal controls within EBS & Job Costs.
- Build the foundation for the internal audit team, including identifying and acquiring necessary skills and technology, establishing more frequent and fluid audit cycles on key areas of focus, assessing the Internal Control Framework, improving information and communication across the organization and facilitating a forward-looking and solution-oriented audit approach.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Indirect
	☐ Implement Effective Public Safety Practices	
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct

Critical Financial Controls

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Enable Employees to Execute Operations Systematically	Indirect
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

A safer workplace will be provided through new procedures, culture and training. Having an ethics and compliance program to follow up on deviations is a powerful tool for reducing pressure to compromise standards. Such a program also supports observations of misconduct, increasing employee reporting if misconduct occurs and decreasing retaliation against whistleblowers. Fewer employees would feel pressured to break the rules and fewer infractions would take place. When they do occur, employees would feel safe enough to tell management so the problem can be addressed internally.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Documentation and enforcement of policies and procedures will strengthen internal controls and ensure accountability and consistency in daily transactions and financial reporting.

Objective: Pursue Project Delivery Excellence

Effective internal controls reduce the risk of asset loss, ensure that plan information is complete and provide for reliable and accurate financial statements. As such, more effective internal controls promote smooth project delivery in accordance with the provisions of applicable laws and regulations.

Objective: Enable Employees to Execute Operations Systematically

With the requisite training and capabilities support, employees will be able to display increasingly improved judgement in more complex cases. This will be of direct benefit.

Reviewing and providing guidance on key roles and responsibilities will better enable employees to identify deviations, assess the impact of those deviations and take appropriate actions. This helps ensure the overall accuracy of financial statements and compliance with laws and regulations. This will become routine - again of direct benefit.

Critical Financial Controls

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Proper controls are central to managing any organization effectively. They contribute to the ability to safeguard assets, use resources efficiently and produce accurate and reliable financial information. This capability is key to managing federal funding.

2.6 Program Risks

Failure to implement internal controls would increase pressure to compromise standards and create the opportunity for financial misconduct. Plans and financial statements would not be complete or reliable and might not be conducted in accordance with applicable laws and regulations. The utility would be unable to properly and routinely close its books, and the review of actual versus forecast financial performance would have to wait for the annual audit.

In the near term, accurate and timely performance data could not be distributed to operational management to assist them in making quality business decisions in a timely manner. The lack of financial management of major outsourced projects makes mismanagement a higher risk and timely delivery of project completion unlikely- leading to increased costs along with an increased risk of asset loss.

If the revamping of internal audit was not implemented or was delayed there would be no assurance of achievement of control objectives relating to operations, reporting and compliance, or mitigation of risks due to significant changes and or fraud. There would be no proper follow up on deficiencies and other matters identified internally and or by external auditors. There would be no process for continual improvement, and performance would likely degrade over time.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$2.4**	**$1.0**	**—**	**—**
SRP Expenditures	$2.4	$1.0	—	—

3.2 Program Resource Requirements

Costs related to the two programs are mostly related to internal labor and consulting support for specialized topics.

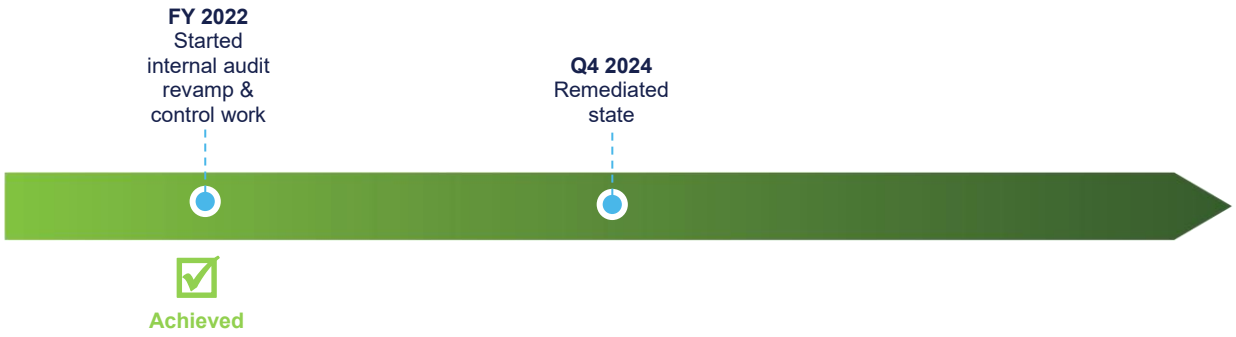
3.3 Estimating Methods & Assumptions

Each project was estimated individually based on the expected resource requirements. Resources and the hours of effort were costed at average labor rates.

Critical Financial Controls

3.4 SRP Program Timeline & Milestones

Each project within the two programs will have its own timeline and milestones based on a project plan. Depending on funding, the items requiring remediation are expected to be complete by the end of 2024.



Land Record Management

1.0 Program Description

LUMA will develop a new record management system that allows for land information to be found easily and managed to utility industry standards. This allows compliance with legal requirements to be documented and shown to satisfy regulators. It also allows user groups to have efficient access to information. In particular, such a system lets Operations and Construction perform their work while respecting land rights agreements.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Current organization of property records make identification of PREPA owned or otherwise acquired property difficult. An improved file format will allow user groups, such as Operations and Construction, better access to pertinent information so that tasks can be completed while respecting the land agreement. This will allow for better efficiency in completing the work and minimize the potential for conflict with the landowner.

LUMA's gap assessment has identified the following areas to be addressed:

- The historical reliance on judicial processes to acquire land rights means that land files are full of court filings and resolutions but may lack important technical information.
- Files are not organized in a manner that allow for a review of maps identifying property rights acquired through each agreement.
- Operations has difficulty determining the limits of the land rights that exist and therefore has difficulty in respecting land agreements during the performance of work.
- Disputes with landowners may arise unnecessarily as a result of neither party having clear information about the land agreement.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

According to T&D OMA, Annex I, Section I(G)(2), LUMA is responsible for maintenance of documentation and acquisition of Easements as required for T&D System operations.

According to T&D OMA Annex I, Section II(A), LUMA is required to manage and maintain all T&D System assets, including easements. In addition, Section 5.19(a) requires LUMA to identify areas to be encumbered by easements for operation, maintenance, repair, restoration, replacements, improvements, additions and alterations of the T&D System and take the necessary actions to acquire and constitute it.

Land Record Management

In the remediated state, LUMA will have:

- Developed a land file structure so that information pertinent to the Construction and Operations departments is easily located and accessed
- Ensured that all new files are organized as per the new land file structure
- Completed the assessment to convert the existing files and defined the project requirements

2.3 Description of Program Completed State

In the completed state, LUMA will have:

- Converted existing land files to the new structure and remedied information gaps in existing land files
- Integrated all land files into a land management system

2.4 Program Activities

- Review of existing land files
- Determination of the structure necessary for the land files, potentially made with the assistance of legal experts
- Assessment of IT and other requirements for a land management system
- Acquisition of land management system
- Full implementation of the new land management system
- Complete conversion of existing files to new file structure and the land management system

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Indirect
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	

Land Record Management

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

Through better landowner management and communications, and as supported with correct and accessible documentation, encroachments onto current rights of way can be mitigated and threats to public safety minimized.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

More efficient use of information and records systems will allow for better relationships with landowners and a reduction in associated disputes, which contributes to better customer perceptions.

Objective: Increase Service Reliability

Access to right of way documentation for maintenance and emergency response is key for reliability of the system and the efficient performance of work.

Objective: Deliver Electricity at Reasonable Prices

More efficient use of information and records systems will aid in delivering the required services and will help minimize the cost of delivering the services.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

The records system to support land management will enable systematic management of the business by reducing time to administer land rights and by improving resource efficiency.

Objective: Pursue Project Delivery Excellence

The ability to use support documentation in an efficient manner to manage land acquisition and settle claims efficiently will improve the execution of capital projects.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Land Record Management

Proof of land rights is a condition for obtaining any federal funding for capital projects, and the records system is integral to providing the necessary documentation.

2.6 Program Risks

The risk in not proceeding with the program is to continue with the present system, which is inadequate. This system has led to poor management of land acquisition and administration and has contributed to inefficient operational work and unnecessary conflicts with landowners.

The risk in proceeding with the program is that it will represent a change from past policy. It will take a change in thinking to execute and complete the file formats in a manner that serves the needs of users and the public rather than the strict legal needs of the land file.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$2.3**	**$2.3**	**$1.8**	**—**
SRP Expenditures	$2.3	$2.3	$1.8	—

3.2 Program Resource Requirements

The land file structure will require an integrated land management system as one element, complete with the necessary IT software and hardware.

Legal resources may be required to develop the file structure.

3.3 Estimating Methods & Assumptions

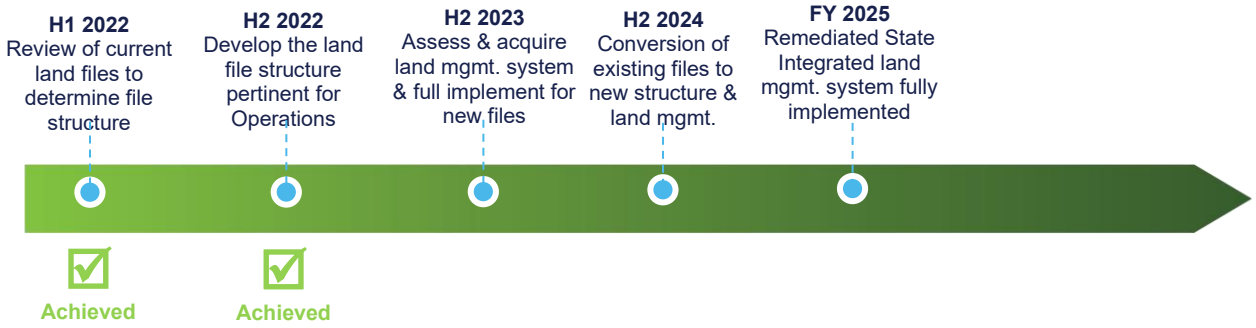
Applicable Standards and Codes: Right of way legislation in Puerto Rico, file requirements (“Ley de Archivo” and associated regulations), PREPA’s Regulation of Easements for the Puerto Rico Electric Power Authority Regulation 7282.

Internal resources from PREPA Catastro office.

LUMA pay scales have been used for internal employee resources.

Land Record Management

3.4 SRP Program Timeline & Milestones



Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking

1.0 Program Description

This program focuses on planning studies for dispatch of existing thermal units, along with new processes to audit costs included in the purchased power and fuel cost adjustment mechanism tariffs administered by LUMA in accordance with Section 5.6 of the T&D OMA. The program includes creation and implementation of reasonable prudent administrative procedures for reporting of those related fuel and other generation costs as described in the T&D OMA and being able to accurately present these costs to the PREB. The program does not include the management or oversight of fuel purchasing or of any Genco functions. Improved information on fuel costs, inventory, and availability will support resource planning as well as the more efficient and reliable dispatch of peaking power plants and other thermal plants. The program aims to improve resource adequacy and lower energy supply costs.

As described in Exhibit H, Section 2.2. of the T&D OMA and subject to the final reorganization plan for PREPA, fuel procurement and management responsibilities for PREPA's generation units will remain with PREPA's Genco unit. According to Section 5.13(b) of the T&D OMA, LUMA shall have the right to reasonably access "... information consistent with Prudent Utility Practice required to perform the dispatch and scheduling of Power and Electricity, which includes fuel availability, fuel cost, fuel inventory, unit availability, unit marginal cost, unit outage schedules, electric system reliability requirements, reserve requirements, identification of must-run generation resources and any other information reasonably requested by Operator consistent with prudent Utility Practice required to perform the dispatch, scheduling, and coordination of Power and Electricity." Under the T&D OMA, LUMA has the responsibility of presenting adjustments to the fuel adjustment and purchased power tariff clauses. Under the T&D OMA, LUMA will manage and administer all existing and future PPOAs.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

The current state includes the following gaps:

- Poor administrative controls and quality control of data related to fuel procurement and consumption, resulting in inadequate tracking of costs and justification of changes in the fuel adjustment clause.
- Fragmented and sub-optimal contract management systems for PPOA administration and inefficient tracking of costs for purchased power clauses which has resulted in criticism from regulator and allegation of errors in public media.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking

2.2 Description of Remediated State

The remediated state will result in:

- An appropriate understanding and accounting of fuel expenses and tracking to fuel adjustment clause in order to comment to PREB. This does not reflect any level of managing the fuel procurement program, but rather defining the information and validity checking processes to be performed by GenCo. The requirements can be defined in the Plant Level Agreements if a new GenCo Operator is responsible for fuel procurement.
- A resource strategy to deploy peaking resources in the most effective dispatch process in order to comply with the Modified Action Plan in PREB's final IRP order and to facilitate least cost dispatch.
- A planning review and approval program for generation capacity based on industry practice with a focus on resource adequacy and system reliability and minimizing load shedding events. Program may need to be further refined to be consistent with future role of Administrator and Generator Operator when those roles become more widely known.
- Improved planning for dispatch of peaking units to support increased renewable energy penetration required by the IRP.

2.3 Description of Program Completed State

The completed state is the remediated state.

2.4 Program Activities

DEVELOP PROGRAM FOR FUEL COMPLIANCE MONITORING AND PPOA CONTRACT MANAGEMENT

- Note that some steps may need to be refined after details of future role of Administrator and GenCo Operator are more widely known.
- Define steps in tracking of fuel procurement and reporting for existing and future contracts to provide LUMA with reasonable prudent information on these costs consistent with Exhibit H of the T&D OMA.
- Define audit and reporting requirements for fuel procurement and usage cycle.
- Develop financial reporting and reconciliation program requirements to report on actual fuel expenditures and to accurately incorporate to the fuel adjustment clause.
- Establish contract management process for management of all PPOA, tracking and verification of costs for accurate incorporation in the purchased power clause and to provide LUMA with reasonable prudent involvement with administering these costs in accordance with existing PPOA's.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

DEVELOP STRATEGY TO UTILIZE PEAKING RESOURCE DISPATCH IN COMPLIANCE WITH PREB'S FINAL IRP ORDER

- Review the utilization of peaking units within system operations and dispatch function.
- Evaluate opportunities to improve dispatch, outage planning and other practices.
- Development of periodic assessment and audit program commensurate with the level of expenditures involved.

Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☒ Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☒ Improve Resilience of Vulnerable Infrastructure	Direct
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☒ Enable the Sustainable Energy Transformation	Indirect
☐ **Other**	☐ Other	

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

This program will help to improve power plant dispatch and resource adequacy, thus lowering total cost to customers and improving overall service reliability across the system.

By improving the review and prioritization of maintenance and other generation investments, this program will improve resource adequacy and resiliency of the existing PREPA generation fleet and utilization of the existing fleet of peakers.

Objective: Deliver Electricity at Reasonable Prices

By prioritizing NME investments, the cost of forced outages can be avoided. Improvements in tracking of fuel costs and administration of PPOAs will help to provide increased confidence mechanisms for changes in fuel adjustment and purchased power clauses.

Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Contract management for PPOAs, better quality data on fuel costs and consumption and improved resource and capital planning will all contribute to management improvements.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

By implementing an optimal gas peaker utilization strategy, the availability and utilization of these assets can be increased, thereby increasing system resilience.

PRIMARY GOAL: SUSTAINABLE ENERGY TRANSFORMATION

Objective: Enable the Sustainable Energy Transformation

By prioritizing NME investments and improving peaker performance, the grid will be better able to integrate new renewables.

2.6 Program Risks

Risks of delaying or not implementing this program include:

- Without an improved fuel monitoring programmatic capability, excess fuel expenditures or inaccurately tracked costs can be passed on to customers through the fuel adjustment clause. This will contribute to continued criticism by PREB and media.
- Poor allocation of capital Necessary Maintenance Expenditure (NME) investments in PREPA generation fleet, excess cost to customers and failure to maintain appropriate resource adequacy levels.
- Without a peaker strategy, PREPA will not adequately implement recent PREB orders in the final IRP order and will forgo an opportunity to increase resiliency.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$1.3**	—	—	—
SRP Expenditures	$1.3	—	—	—

3.2 Program Resource Requirements

Program resources will be required for third party engineering services and technical experts.

Resource Planning and Processes to Improve Resource Adequacy and Cost Tracking

3.3 Estimating Methods & Assumptions

- Estimates were calculated based upon a gap assessment of the existing capabilities and application of industry best practices.
- Estimates are primarily hourly T&E costs to define and deliver necessary end results.
- Hourly rates from existing table of rates included in T&D OMA which varied by position and by function.
- Detailed person-hour estimates were developed for specific sub-tasks.

3.4 SRP Program Timeline & Milestones



Improvements to Systems Dispatch for Increased Reliability and Resiliency

1.0 Program Description

This program deals with the repair of non-functioning equipment and processes to allow for the System Operator to have data to carry out economic dispatch of generation assets, in accordance with the System Operation Principles and applicable procedures, and to allow for the safe and reliable operation of the system.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA is required to dispatch, schedule and coordinate power and electricity from available generation assets and coordinate the scheduling of load requirements and power with IPPs (pursuant to their generation supply contracts) and with GenCo (pursuant to the GridCo-Genco PPOA). LUMA is also required under the OMA to implement and apply the System Operations Principles and perform any other services related to the dispatch, scheduling or coordination of power and electricity from existing and future available generation assets.

PREPA does not have verified data on plant performance parameters to estimate heat rate and performance curve data for baseload units.

There is no functioning automatic generation control (AGC) capability for several of PREPA's northern plants, which is the general standard for most operating generation fleets in the fifty US states. Although some AGC equipment was previously installed and had functional capabilities in the past, this capability has not been adequately maintained and/or no longer exists.

It has been described to LUMA, although not verified in any engineering report or assessment, that the components and equipment necessary for AGC have essentially been installed but are not being utilized for a variety of reasons. This program involves an initial effort to improve estimated performance by utilizing installed, but not operational AGC and Plant Information (PI) system capabilities. The PI System is a data collection and analysis product. It remotely captures data from sometimes several hundred probes installed at different plant locations to provide real time understanding of performance and other operational indicators throughout the plant.

If this capability cannot be quickly achieved then another, more extensive effort will be needed to conduct performance tests and implement AGC capability. At the time that this decision will need to be made, a cost justification assessment will also need to be completed that reflects LUMA's improved understanding of the cause and impact of existing deficiencies. The more detailed estimate of the costs of performing the required test to achieve those capabilities is needed to confirm the benefits of acquiring full AGC capability and accurate heat rate performance information.

Information exchange between PREPA generation units and system operations, and quality of data are all below minimum industry standards. Communications between generators and control dispatch center is also inadequate.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, the control center, operating in accordance with the System Operation Principles and the applicable procedures, will:

- have access to accurate, reliable data such as heat rate and operating performance curves for the major PREPA generation units,
- receive remote data of major interconnected generators due to improved data monitoring and improved communications procedures, and
- have appropriate AGC capabilities that are operable and allow for enhanced stability of the bulk power system where this is cost-justified.

LUMA should be able to set system operating parameters within defined levels to ensure safe, reliable and resilient operations, and to monitor and maintain metrics such as power quality and voltage control levels.

2.3 Description of Program Completed State

The completed state is the same as the remediated state.

2.4 Program Activities

ESTIMATE PLANT AND SYSTEM PERFORMANCE METRICS

- Assess the root causes for loss or lack of AGC capability and control capability from central dispatch center
- Review existing PI systems data collection and communication with system operations center
- Resolve data collection and reporting discrepancies where possible
- Validate and/or estimate parameters using PI System and other data
- Identify any additional tasks to facilitate more efficient dispatch by improving precision of date to estimate heat rate and performance curve data for baseload units

VALIDATE PLANT PERFORMANCE METRICS

- Reassess the cost and benefits of acquiring improved performance data after LUMA's review of the estimated performance of existing plants and a more detailed estimate of costs to perform such tests
- Conduct heat rate test, mass balance and incorporate validated performance parameters into dispatch model. If the new GenCo Operator has been selected at this time, it is feasible that they could conduct such tests or PREPA can arrange for such tests if the GenCo Operator has not been selected, with reasonable involvement by LUMA to ensure validated information in compliance with ASME Power Test Codes is acquired
- Identify any repairs of any non-functioning telemetry or SCADA system equipment

ENABLE AGC BETWEEN BASELOAD PLANTS AND SYSTEMS DISPATCH CENTER

- Assess root causes for why AGC is not currently operable, and define what is needed to restore capability
- Identify costs required to enable AGC and make a reassessed decision on the cost and benefits of acquiring full AGC capability on major baseload plants or if manual operation has a better cost benefit ratio

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☐ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☒ Increase Service Reliability	Direct
	☒ Deliver Electricity at Reasonable Prices	Direct
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☒ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

The real-time monitoring and correction capability installed through this program will help to improve the safety of overall operations primarily through improved situation awareness.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Increase Service Reliability

This program will improve service reliability by providing real-time monitoring and situation awareness, along with implementing automatic corrections remotely before system failures occur.

Objective: Deliver Electricity at Reasonable Prices

By more effectively dispatching generation plants, this program will help to lower costs.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Employees to Execute Operations Systematically

By automating more interactions between dispatch center and generation units to a faster, more precise manner than the existing manual processes, this program will enable employees to execute operations more efficiently.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Improve Resilience of Vulnerable Infrastructure

By adding automated response capability, this program will allow adjustments to be made to the system to avoid larger problems and load shedding events, thus improving overall resilience.

2.6 Program Risks

The risks associated with not moving forward or delays associated with this program include:

- Increasing costs as maintenance costs rise from advancing operational degradation
- Degradation of reliability from increased reactive maintenance requirements
- Risk of outages increased since the system response will be too slow to avoid load shedding events due to the current manual process and restoration after a storm event will be less effective
- Increasing challenges of managing frequency and voltage on the northern half of the island with a totally manual system as increased solar resources are added

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$1.2**	**—**	**—**	**—**
SRP Expenditures	$1.2	—	—	—

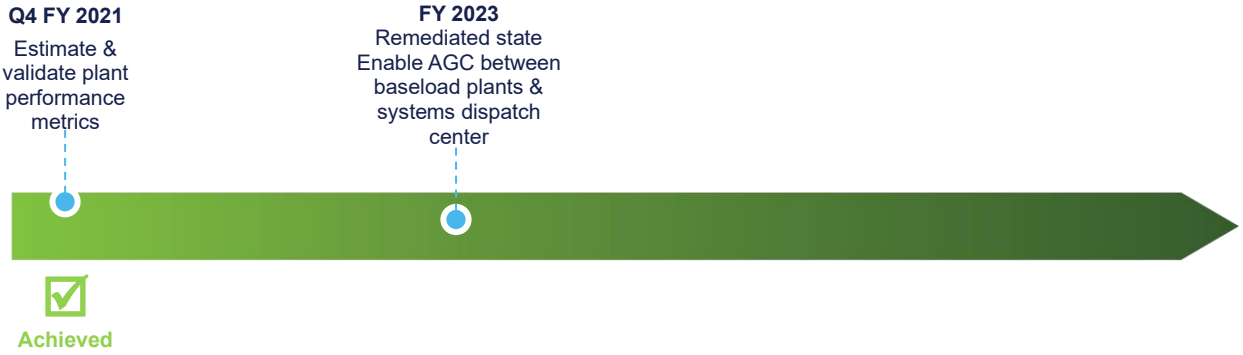
3.2 Program Resource Requirements

The funds will be primarily used to pay for third party engineering and consulting services and equipment refurbishment.

3.3 Estimating Methods & Assumptions

- Estimates were calculated based on third party costs to implement similar modifications and equipment seen at other power production facilities
- Estimates are primarily hourly T&E costs to define and deliver necessary end-results
- Hourly rates are from the existing table of rates included in OMA and market rates for engineering services which varied by position and by function
- Lump sum estimates were developed for specific sub-tasks which total at approximately $1 million of the total $1.2 million estimated costs

3.4 SRP Program Timeline & Milestones



Land Acquisition & Dispute Management

1.0 Program Description

LUMA will introduce processes and procedures from land management industry practice to:

- Manage records
- Carry out land acquisition
- Interact with landowners to resolve disputes, and (iv) begin to establish landowner relations concepts within the land management practices

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Instead of using its own in-house business processes to resolve land disputes, PREPA relies heavily on the legal system and court resolutions to interact with affected landowners and, eventually, settle landowner claims. These claims can relate to payment disputes, damage claims, encroachments, land access disputes or other disputes relating to the management of land rights. This overreliance on the legal system leads to:

- Land management relying on the resolution of legal disputes that take a long time to settle, leading to high ongoing litigation costs and deteriorating relations with landowners.
- Delays due to ill-defined procedures for landowner relationship and land management.
- Uncertainty due to the unknown number of current land disputes and encroachments in the existing system, which cannot be determined from the existing system.

Additionally, the quality of information in line files is inconsistent and poorly organized, meaning that it is difficult to effectively implement land management best practices.

Field personnel are expected to interact with landowners directly without support of specialized land management professionals who have access to land documentation and specialized knowledge. There exists high potential for conflicts with landowners and ultimately legal claims for entering private property to gain access and use of temporary easements.

Current industry practice is to have specialized land professionals that manage the process of acquiring property rights, interacting directly with landowners, organizing necessary documentation and supporting field operations, including for vegetation management activities, where applicable.

2.1.1 Additional Gaps Identified Post-Commencement

Technical and professional specialization in land management and landowner relations are not available at the necessary level to perform to industry standards.

The requirements for notifications established under law have been identified; however, the necessary procedures and practices are developing.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

Section 5.19 (a) of the T&D OMA requires LUMA identify the areas that are required to be encumbered by Easements for the operation, maintenance, repair, restoration, replacements, improvements, additions and alterations of the T&D System. With respect to each constitution of Easement, LUMA shall:

- Develop all necessary supporting material including required appraisals under Regulation 6955,
- Negotiate terms and conditions with fee owners/lienholders,
- Procure required Governmental Approvals,
- Prepare petition of condemnation to be filed if a consensual agreement is not reached, (v) cause recordation of the Easements
- Take all other action necessary to constitute the Easements

Section 5.19(c) of the T&D OMA requires LUMA identify real properties or rights that need to be acquired for the O&M Services. With respect to each purchase, LUMA shall:

- Develop all necessary supporting material including required appraisals under Regulation 6955.
- Negotiate terms and conditions with fee owners/lienholders.
- Procure required Governmental Approvals.
- Prepare petition of condemnation to be filed if a consensual agreement is not reached. cause recordation of the deed vesting title on PREPA or the Commonwealth.
- Take all other action necessary to purchase the land.

Section 5.19(d) of the T&D OMA requires LUMA procure the required concession rights permitting the use of real estate assets under the public domain necessary for the operation, maintenance, repair, restoration, replacement, improvement additions and alterations of the T&D System. With respect to each such real property, LUMA shall:

- Develop all necessary supporting material including surveys.
- Negotiate terms and conditions with Governmental Body.
- Procure required Governmental Approvals.
- Cause recordation of the Concession.
- Take all other action necessary to constitute the concession.

In the completed state, land acquisition and administration processes will be fully compliant with Applicable Law and settlement options for claims will have been fully developed.

Company procedures designed to understand the underlying dispute and find acceptable solutions will have been fully implemented for landowner management such that landowners and outside parties can become more confident in quickly reaching fair and reasonable agreements. In the completed state, landowners will also have confidence that contracts will be respected.

Field personnel will be able to work more efficiently and focus on work on assets as most interaction with landowners handled by specialized land managers.

Land Acquisition & Dispute Management

By developing a capability to settle claims without resorting to the legal system, landowner claims can be settled in a fair and expeditious manner without the time and expense required for litigation, which is cumbersome, time consuming and expensive. This will help improve landowner relations with the company and reduce the time and cost to achieve a resolution through the court system. This will also minimize encroachments on the right of way to enhance the safety of the T&D System and reduce potential liabilities with outside parties.

2.4 Program Activities

- Full development of procedures for land acquisition and land administration.
- Identification of new claims and review of issues categorized under current legislation.
- Using information to settle claims and to evaluate cost/benefit of settlement vs. litigation.
- Identification of critical encroachments and development of actions plans in response to encroachments.
- Review of existing right of way or land disputes and develop understanding of potential liabilities.
- Based on the better understanding of potential liabilities, develop and implement internal procedures so that new claims resulting from construction or operations activities are minimized and are resolved quickly and fairly.
- Develop guidelines for land agents (LUMA employees or third parties depending on the size of land acquisition) to engage with landowners in order to prevent disputes from arising and to settle claims quickly.
- Ensure procedures are developed so that required payments are completed in a timely fashion to create a positive customer experience.

2.4.1 Additional Activities Identified Post-Commencement

Develop land lists for all existing lines.

2.5 Develop procedures and training for land agents Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☐ Promote a Safe Workplace	
	☒ Implement Effective Public Safety Practices	Direct
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct
	☒ Enable Employees to Execute Operations Systematically	Direct

Land Acquisition & Dispute Management

Primary Goals	Objectives	Direct or Indirect Impact
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Implement Effective Public Safety Practices

Through landowner management and communications, encroachments onto current right of way can be reduced thereby minimizing threats to public safety.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

The correct and timely payments to landowners will help improve customer perceptions.

Objective: Increase Service Reliability

Access to right of way for maintenance and emergency response is key for reliability of the system.

Objective: Deliver Electricity at Reasonable Prices

More efficient use of existing resources in delivering services will help streamline the cost of service delivery.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

The development of a land management process will enable systematic management of the business by reducing time to administer land rights and by improving resource efficiency.

Objective: Pursue Project Delivery Excellence

The ability to manage land acquisition and settle claims efficiently will improve the execution of capital projects.

Objective: Enable Employees to Execute Operations Systematically

The new procedures and guidelines will provide the necessary structure and authority for employees to proactively settle claims rather than react to court filings.

Land Acquisition & Dispute Management

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Proof of land rights is a condition for obtaining any federal funding for capital projects.

2.6 Program Risks

The most important risk to not proceeding with this program is to continue with the present system of relying on legal processes. This has led to a high number of disputes in the court system and the costs associated with litigation. Further, this methodology has led to poor landowner relations and has contributed to a high level of mistrust between the parties.

The risk in proceeding with the program is that it will represent a marked change from past policy. Employees will have to adapt from a system that defaulted to the legal system to obtain and administer land rights to a system of accountability for decisions that need to be made in the best interest of the rate payer. It will take a change in thinking in order to execute and complete contracts more efficiently and fairly.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditure	**$1.2**	**$1.2**	—	**—**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

The primary resource required is the integrated land management system.

3.3 Estimating Methods & Assumptions

- LUMA pay scales assumed for internal resource.
- Previous contractor rates assumed for third parties.
- Applicable standards and codes: Right of way legislation in Puerto Rico, File requirements (“Ley de Archivo” and associated regulations).
- Internal resources from PREPA Catastro office.

Financial Management Functions

1.0 Program Description

This program addresses financial management functions including procurement and contracting, real estate, and risk and insurance. Includes:

- Procurement: Setting up a strategic sourcing function for procurement, and standard processes, procedures, systems and accountabilities for Procurement and Contracts.
- Real estate: Defining processes to clarify accountabilities and approval limits, along with executing a contract with a third-party real estate advisory firm for assistance with property identification, acquisition and ongoing transaction support.
- Risk and Insurance: Putting in place a risk and insurance team and fully functional ERM system.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

This is a program that addresses gaps over a number of Financial Management functions:

- Procurement & Contracting ($4.3M, 88% of program)
- Real Estate ($0.2M, 4% of program)
- Risk & Insurance ($0.4M, 8% of program)

PROCUREMENT & CONTRACTING

There is no strategic sourcing function in PREPA and processes, standards and systems need to be set up in accordance with new procurement requirements, including from the perspective of federal funding. This means that there is no team that proactively manages procurement activities, including leveraging spending across departments/locations, setting up blanket and longer-term agreements, etc. Anticipated capital and operational projects and spending in the upcoming years require upgrading and strengthening of all procurement and contracting resources and practices.

Gaps addressed by this program:

- Multiple contracts existing with a single vendor will be consolidated so that the end user can more effectively (accurately and quickly) administer contracts to meet business needs.
- Master agreements will help to enable effective deployment of funding, as the need for new agreements to be set up for each individual procurement with a vendor will be minimized. The business will be able to capitalize on more flexible, broadly scoped existing agreements.
- Opportunities for economies of scale will be capitalized on and cost savings will be achieved through negotiation and consolidation of similar scopes of work.
- Training procurement resources on new processes and contract templates will enable them to support the business efficiently and effectively.

Financial Management Functions

REAL ESTATE

Currently, there is a lack of internal controls and communication between business units and Real Estate which causes a lack of strategic planning and a reactive environment. This situation impedes the ability to be proactive and install good planning practices, information and process flow, etc. There does not appear to be a collaborative work environment between Real Estate and the other departments that are included in the real estate diligence process. Contracts and other Real Estate related documents get caught up in legal for long periods of time with no accountability regarding responsibility or transaction management. It is difficult to predict how long internal reviews will take to complete, and accountabilities are not clearly defined.

Gaps addressed by this program:

- Addresses insufficient internal controls and communication between business units and Real Estate through the implementation of processes containing clear accountabilities.
- Reduces delays/bottlenecks in acquisition and disposition processes for real property.
- Formalizes the relationship between Environment and Real Estate to enable compliance with and monitoring of environmental standards for applicable facilities.
- Creates a partnership with a Real Estate advisory firm which will eliminate the need for internal resources used for transactional functions. Advisory firm is paid by landlords in traditional transactions therefore creating a further reduction in budget.

RISK & INSURANCE

- No real loss analysis or forecasting seems to be done. There is not a risk management information system in place to collect exposure values or to trend or track losses at any level.
- Losses seem to be reviewed once a year at renewal and since the claims function is largely handled by legal, there appears to be a disconnect between the department purchasing the insurance and the department handling claims. This is not ideal and is not common.
- The risk department seems to be disconnected from some of the processes that are normally under a risk department's purview.
- It is apparent that the risk department is not fully aware of all the exposures the company faces and may have a shortfall in the understanding of worldwide insurance markets and solutions available. To this end, the department and PREPA would benefit from the implementation of an Enterprise Risk Management system.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

In the completed state LUMA will have achieved the following:

PROCUREMENT & CONTRACTING

- A fully staffed strategic sourcing function will streamline multiple agreements with the same vendor down to one master agreement, simplifying both the contract management (i.e., renewals, amendments) and the contract administration (i.e., transforming approved requisitions into purchase orders, reviewing / approving / coding invoices, etc.). This will be much simpler and faster for the end user. The organization will benefit financially from negotiations with vendors that will focus on leveraging spend for maximum value. The supplier ecosystem will be segmented and partnerships with strategic vendors will be built.
- Processes, standards, procedures and accountabilities for procurement such that contracts are clearly defined and communicated to all stakeholder groups and well developed to the appropriate performance and quality levels to meet the needs for capital projects, operations and general business functions.

REAL ESTATE

- Defined processes with clearly documented accountabilities and approval limits. These will clarify how Real Estate will work with the business units and supporting functions to enable due diligence and efficient management of shared responsibilities (i.e., contract execution, legal reviews, etc.). All teams involved will have been thoroughly trained on the processes and their responsibilities therein.
- An executed contract with a third-party real estate advisory firm for assistance with property identification, disposition plans, property acquisition and ongoing transactions.
- Documented collaborative processes with the Environment team on environmental assessments
- Reviews for all property acquisitions/dispositions.
- Ongoing computerized maintenance management system for existing facilities occupied to minimize and monitor environmental impacts on leased/owned facilities.
- The implementation of a Real Estate Portfolio Management Platform to support consolidation of all leased and owned facility information and documentation into an online platform that allows for lease abstraction, portfolio metrics, critical date reminders, financial reporting, etc. which results in effective portfolio management and reporting.
- The development of effective internal controls and documented processes to ensure that risks are identified, measured and mitigated prior to acquisition and disposition of real property as well as ongoing occupation and operation of facilities.
- Implementation of defined processes and cross functional collaboration on due diligence to engage in risk identification, mitigation and effective management of risks while in occupation of facilities. Formalized processes will be developed between the Real Estate and Facilities, Risk, Legal and Environmental departments.

RISK & INSURANCE

- A well-trained risk and insurance team who are knowledgeable about both the current risks affecting the organization, as well as solutions available in the worldwide insurance market, including a fully functioning Enterprise Risk Management system.
- The capability to meet the needs of end users quickly and effectively with minimal non-strategic involvement from other teams, other than on an as needed basis.

- Ability to make recommendations to end users based on exposures and loss analysis being completed thoroughly and regularly, alongside forecasts that are developed and maintained.

2.4 Program Activities

PROCUREMENT & CONTRACTING

- Hiring and training of strategic sourcing resources
- Training of end users on contract administration and how/when to engage the procurement team
- Undertaking of spend analysis activities, identifying and capitalizing on opportunities to leverage spend and/or streamline multiple contracts to master agreements
- Development and improvement of resources, processes, procedures, standards and systems.

REAL ESTATE

- Partnering with a real estate advisory firm to assist in property identification, development and implementation of disposition plans, property acquisitions and ongoing transactional support.
- Development of an approval matrix and approval process for business units.
- Executive management approval for all real estate transactions.
- Development of cross functional collaboration and process flow for due diligence on all real property acquisitions and dispositions.
- Work with Environment team to identify areas of collaboration and document supporting processes.

RISK & INSURANCE

- Provision of training and professional development opportunities for Risk and Insurance team.
- Formalization of guidance on assessing internal and external enterprise-wide risks (enterprise risk management).

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Indirect
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Direct
	☒ Pursue Project Delivery Excellence	Direct

Financial Management Functions

Primary Goals	Objectives	Direct or Indirect Impact
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Direct
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PROCUREMENT & CONTRACTING

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver Electricity at Reasonable Prices

Negotiate discounts and achieve best value for the organization through spend leveraging and category management activities.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Pursue Project Delivery Excellence

Enable efficient transaction processing through the implementation of master agreements.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Create strategic agreements with critical vendors to facilitate the efficient deployment of funding to capital (federally funded) projects and programs.

REAL ESTATE

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Establish and document processes and accountabilities for interdepartmental activities.

Objective: Enable Employees to Execute Operations Systematically

Establish and document process flow and controls for real property acquisition and dispositions, use and occupancy including approval matrix and reporting.

Financial Management Functions

RISK & INSURANCE

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Exposure and loss analysis will inform areas of focus to improve employee safety.

2.6 Program Risks

PROCUREMENT & CONTRACTING

- Not having a strategic sourcing function means that procurement will remain reactive and will not be able to facilitate transaction speed and cost savings through leveraging existing spend.
- Not training end users on contract administration results in the organization not being able to realize the maximum value possible from each of its agreements.
- Not training end users on contract administration can impede the deployment of federal funding.
- Processes, standards, procedures, systems must perform at higher levels quality to respond and be adequate to the needs for procurement and contracting on capital projects, operational needs, general business functions, and to comply with applicable Puerto Rico and federal requirements.

REAL ESTATE

- Not hiring a third-party real estate firm will necessitate hiring internal resources to complete this work at an incremental cost. The advisory firm is paid by landlords in traditional transactions therefore creating a further reduction in budget.
- Not establishing and documenting processes and clear accountabilities around interdepartmental activities will result in project delays and difficulty in fulfilling end user requirements.

RISK & INSURANCE

- Inefficient and lengthy claims handling processes for claims handled within Risk & Insurance
- The lack of a fully functioning Enterprise Risk Management program could lead to uninsured risks or the overpayment for certain risks as a result of not fully comprehending enterprise risks.
- Higher than necessary insurance premiums.
- Without the ability to track losses or do forecasting, organizations are less likely to be able to convince insurance carriers to lower their risk profile. A carrier is less likely to provide their preferred rates if they know their client is not attempting to see into the future and maximizing efforts to control claims.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.6**	**$0.6**	**$0.5**	**$4.1**
SRP Expenditures	—	—	—	—

Financial Management Functions

3.2 Program Resource Requirements

PROCUREMENT & CONTRACTING

- Eleven full-time employees (one director, two managers, eight specialists).

REAL ESTATE

- 0.25 full-time employee - Development of internal controls and processes related to the acquisition and disposition of real property.
- 0.25 full-time employee - Development of cross function collaboration and process flow for due diligence on all real property acquisitions and dispositions.
- 0.25 full-time employee - Implementation of third-party real estate advisory firm.

RISK & INSURANCE

- One full-time employee - Exposures, loss analysis and forecasting
- One full-time employee - Claims handling

3.3 Estimating Methods & Assumptions

PROCUREMENT & CONTRACTING

Estimates are based on the number of positions to be added at an average salary rate for that position.

REAL ESTATE

Assumed labor rates for manager and professionals are based on labor rate estimates provided for LUMA budgeting purposes.

RISK & INSURANCE

Estimate based on past experience with insurance and risk management consultancy engagements of similar size and nature. The knowledge and findings will be transferred to permanent LUMA staff for incorporation into processes and procedures.

Waste Management

1.0 Program Description

In accordance with the requirements of the T&D OMA Section 5.10 and the scope of T&D OMA Services specified in Annex I, LUMA will install new equipment and implement management processes to comply with environmental statutory requirements and support safe and efficient operations. The program includes installing secondary containment to prevent contamination, ensuring proper containers are in place to store wastes and, when required for site operations, processing, or removal of accumulated waste debris.

LUMA will take actions with respect to pre-existing environmental conditions, including accumulated waste, in accordance with the T&D OMA Section 5.10(b).

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Many facilities are not currently in compliance with EPA requirements under the Resource Conservation and Recovery Act and the Clean Water Act (specifically, Title 40, parts 112 and 273) and Department of Natural and Environmental Resources (DNER) requirements under the Non-Hazardous Solid Waste Management Regulation. Processes and practices are not in accordance with Prudent Utility Practice. Many sites have accumulated mixed wastes collected over long periods of time. Accumulated wastes include decommissioned transformers, poles, used oil drums, light ballasts, scrap wire, and miscellaneous equipment and building debris. The accumulated wastes are not properly segregated, labelled, stored, and removed. Often, the accumulated wastes are stored immediately outside a building or beside constructed containment areas, preventing access or use of containment areas. Universal wastes are being collected and stored at sites for longer than one year. Liquid wastes are frequently stored without required secondary containment. Many facilities lack maintained spill response equipment to respond to incidents.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In a remediated state, LUMA operations will comply with the regulatory and legal requirements listed above. LUMA will have established processes and procedures on proper handling. LUMA employees will have improved awareness of appropriate waste management practices and will have appropriate tools and equipment on site to dispose of wastes and respond to spills while minimizing environmental impact.

Waste streams will have appropriately constructed and labelled storage containers. Newly generated wastes will be removed at regular intervals. Liquid storage will also have required secondary containment. Appropriately sized waste bins will be in place for routinely generated wastes. Routine waste streams will be clearly labelled and stored. Site spill kits will have been restocked allowing operations to adequately

respond to spills. The potential for future environmental liabilities will be reduced due to properly handled wastes.

2.3 Description of Program Completed State

Upon completion of the program, facilities will be well organized and have the appropriate tools and equipment to prevent environmental impact from the management of waste. Accumulated wastes will be removed or mitigated in accordance with the plan between regulators and LUMA and according to T&D OMA Section 5.10(b). Used spill kits will be restocked after use ensuring timely and immediate response to any spill.

LUMA operations will employ leading industry practice in waste management via programs and processes that encourage regular recycling and reuse of materials. LUMA employees will be knowledgeable on how to handle new waste streams.

2.4 Program Activities

- Taking into consideration the Baseline Environmental Study that will be completed during the Front-End Transition Period by PREPA as required under Section 4.10 (f) of the T&D OMA, complete assessment of high usage sites to quantify accumulated waste volumes and determine appropriate containment in accordance with EPA and DNER regulations.
- Engage with regulators to provide information and receive feedback on improvement plan.
- Removal of accumulated wastes will occur when required for site operations (for example, to enable access to a containment or storage area or when accumulated wastes prevents mobility within a site), all following the procedures specified in T&D OMA Section 5.10.
- Procure additional waste containment bins and install secondary containment at facilities storing liquids when required.
- Replenish or replace spill kits first at high-usage sites then at all locations to encourage timely spill response and clean-up.

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect

Waste Management

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Well organized and managed sites with use of waste storage and containment equipment will reduce the likelihood of injuries and equipment damage that are more commonplace in congested and disorganized work environments lacking proper equipment.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business

Proper waste and liquid storage equipment and processes will ensure waste management contractors can easily and routinely remove waste.

2.6 Program Risks

This program reduces potential and actual environmental liability and puts in place processes to avoid or minimize future environmental liabilities. Not proceeding with the program increases the risk of potential environmental contamination. The program also promotes worker safety and efficient work practices. Lack of the program will delay improvements regarding worker safety and improving operation practices to industry standard levels.

Waste Management

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.5**	**$0.4**	**$0.1**	**$0.2**
SRP Expenditures	$0.5	$0.4	—	—

3.2 Program Resource Requirements

- A project manager and contractors to complete work.
- Procurement representatives to establish contracts and purchase spill clean-up and secondary containment materials.

3.3 Estimating Methods & Assumptions

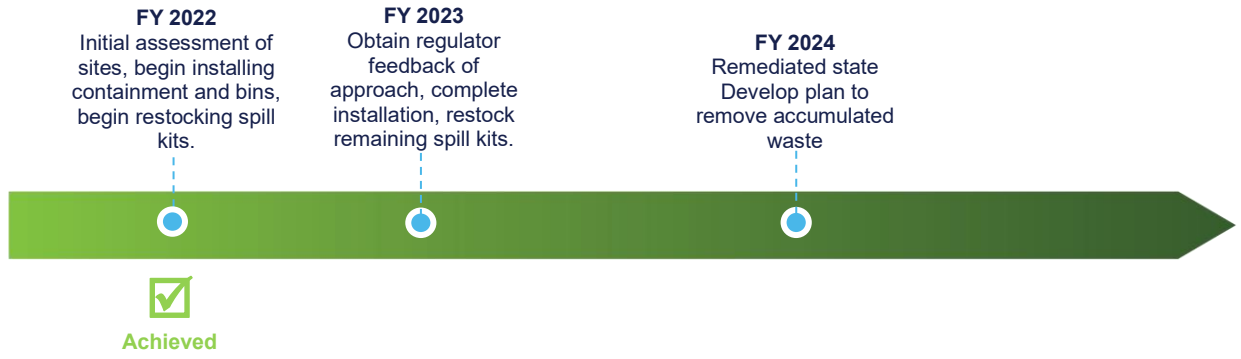
It is assumed that 300 sites have some degree of accumulated wastes, of which 35 sites require a very high amount of clean-up, 115 sites require a high amount of clean-up, 75 sites require a moderate amount of clean-up, and 75 sites require a small amount of clean-up. These estimates were based on information collected from site visits and from Sargent & Lundy site reports.

The following assumptions were used to support estimates:

- Local landfill costs were used to generate estimates for tipping and landfill fees.
- Costs from US providers were used for estimates of spill containment equipment.
- REDACTED [redacted].
- Estimated 10% overhead for project management, contract administration, waste assessments and logistics.

Detailed site assessments will be completed in the first year to define waste streams, storage options, and disposal requirements in accordance with Section 5.10(b) and enable us to refine cost estimates.

3.4 SRP Program Timeline & Milestones



IT OT Collaboration & Analytics

1.0 Program Description

LUMA will upgrade and implement technology solutions to support collaboration across the organization, provide employees with access to relevant content to do their work, the ability to track the performance across the organization and the ability to drive data-based decision making through the use of analytics. This program also includes development of a strategy, along with target architecture and the associated roadmap, for a data analytics structure to better support critical decision making across the company. The program will also implement a centralized repository for internal and external reporting of performance metrics and expand data sources as business needs dictate.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

LUMA is charged with:

- Overall management of approximately 4,000 users who require secure access to corporate policies, procedures and practices and, the ability to collaborate across business units in an efficient manner
- Ensuring the efficient operations of the T&D network by reporting on contracted reporting metrics as well as implementing internal reporting metrics to measure operational effectiveness
- Developing strategic investment plans that are based on data driven decision making

The current state of the technology landscape for providing collaboration and analytical capabilities varies greatly across the PREPA organization and while technology advances have been made it has been done so in a siloed view without an overarching and executable strategic plan.

This indicates that PREPA is aware of the need to address the elements of collaboration management and data driven decision making and is starting to apply them in specific areas.

Gaps requiring remediation exist in all areas of collaboration management and reporting & analytics, for example:

- Lack of a unified strategy and governance combined with a lack of defined organizational goals.
- While PREPA implemented an enterprise content management/document management solution, that solution has not been maintained and is now out of vendor support.
- The existing content management/document management solution was not implemented from a corporate view; therefore, document management practices, standards and tools vary across the organization.
- Limited document classification, retention, or disposal practices.
- Lack of standardization across the organization for document management.
- Lack of a central repository of information for all projects to enable central management oversight of project progress and resource assignment, provide the ability to track consistent project information and use common processes through the expansion of capabilities to all project types.
- Corporate policies and procedures are managed in file folders with limited employee access.

- Lack of a standard for corporate email accounts resulting in poor circulation of critical communications among employees.
- Lack of a centralized business process model repository or toolset for business processes. This makes onboarding of new resources difficult and does not support maintenance, and redesign of processes.
- Lack of formal documented IT OT business processes aligned to an industry framework for the management of incidents, problems, request fulfillment and performance.
- Lack of shared collaboration space across the organization, with SharePoint only used in limited capacity.
- Lack of standardized process flow makes it difficult to track efficiency.
- The process for reporting on electrical network performance metrics does not leverage the capabilities within the outage management system but rather extracts the raw data to a custom-built application where the data is manually manipulated in a non-auditable manner and reported.
- Lack of established KPIs and other performance metrics within the IT OT department although service desk tickets are starting to be tracked within the Jira tool.
- PREPA currently has seven reporting and analytics tools, each implemented in isolation with the intent of only reporting/analyzing data from a single source. Many of these reporting and analytic tools are now out of date and not vendor supported.
- PREPA has recently implemented a data lake on Azure with the initial data source being limited Customer Care and Billing data.
- Historical data does not exist which hinders establishment of data-driven targets.

As a whole, the IT OT department's ability to support and enable collaboration across the business and to enable the business to progress to data driven decision making has been hampered by the lack of corporate driven strategies for collaboration, content management, performance metrics and drivers, combined with siloed and unsupported software solutions.

2.1.1 Additional Gaps Identified Post Commencement

No additional gaps identified at this time.

2.2 Description of Remediated State

This program is not part of the SRP.

2.3 Description of Program Completed State

The IT OT Collaboration and Analytics program addresses major deficiencies that were identified in LUMA's gap assessment. These deficiencies span management systems and technology, performance metrics and provide for needed improvements in outage management technology. The program includes:

- Implementation of LUMA's internal collaboration space to enable knowledge sharing across the organization. This project will also implement department specific locations for sharing within the department and within the organization. SharePoint will be used to deliver Intranet services to employees. The current site will be re-designed in a way founded on both library sciences and the new organizational structure.
- Defining usability governance and publishing standards for all content.
- Implementation of a central repository of information for all projects to enable central management oversight of project progress and resource assignment, provide the ability to track consistent project

information and use common processes through the expansion of capabilities to all project types. This program will provide the ability for sustainable training to less experienced employees working on capital construction project management. The program will also provide for consolidated and consistent project reports to customers and management by utilizing the central repository and integration of the project management toolset with the financial system.

- Upgrade/Replace PREPA's enterprise content management tool. Assess the available approach(es) to follow vendor upgrade path(s) and restore PREPA to licensed status, allowing access to vendor support.
- Evaluate and implement software solutions to deliver a central repository for business process models based on best practices aligned with business process modeling standards.
- Evaluate and implement an Enterprise Architecture tool to support the development and maintenance of business, information, application, and infrastructure architectural artifacts.
- Develop a strategy, target architecture and roadmap for achieving the target data analytics architecture while ensuring fit-for-purpose solutions are maintained and the business will be better supported for critical decision-making with ready access to both structured and unstructured data. The intent of the analytics strategy is to identify a first set of requirements for analytics use cases and to drive identification of necessary data and its availability.
- Implementation of a centralized repository to enable the internal and external reporting of performance metrics. This project will provide workflows to load source data, maintain history of data, construct the metrics and provide for review and approvals of metrics.
- Expand on the core configuration of the data lake to additional data sources as business criticality dictates, this initiative will add new data domains to the data lake - involves sourcing data, modelling / extending schema(s) within the data lake, building data extract and cleansing routines.
- Extend the data historian to additional data points and upgrade the software to ensure continued vendor support.

In the program completed state, employees will have access to relevant data and knowledge with secure and reliable external access. This program will also provide performance management reporting and dashboard systems to support timely operational and strategic data driven decision-making, along with the ability to provide timely response to requests for information from the regulatory and other stakeholders.

2.4 Program Activities

- Establish a corporate standard for email accounts
- Establishment of document standards and centralized repositories to ensure employees have access to content that is essential to perform their duties in a safe and secure manner
- Establishment of internal collaboration channels (intranet)
- Upgrades / replacement of end-of-life software solutions supporting content management
- Strategy and implementation plan for rationalization of analytics tools
- Establishment of performance metrics for IT OT services

Following the above activities, the 10 projects that comprise the overall IT OT Collaboration and Analytics program will be implemented in full as follows. The expenditure across this program addresses the requirement to upgrade/replace existing technologies, extends capabilities within existing technology and introduces new technologies to further enable the business.

IT OT Collaboration & Analytics

The resulting program will encompass the people, processes and technology required to ensure the success of the comprehensive program.

PEOPLE

- Design the LUMA internet SharePoint site based on leading industry library science standards and optimizing how teams work and collaborate through enhancements in the secured internal communication channels
- Define role-based content management needs based ensuring employees have access to the relevant information to complete the work
- Design the data schema for the data lake expansion based on business-critical data ensuring integrity of the data
- Design LUMA's process model hierarchy and standards

PROCESS

- Define and implement IT OT performance metrics and processes for capturing source data
- Define workflows to load source data, maintain history of data, construct the metrics and provide for review and approvals of performance metrics for internal and external reporting
- Define processes for loading source data to the data lake
- Develop and implement LUMA process for publishing content

TOOLS AND TECHNOLOGY

- Upgrade / replace existing content management solution
- Evaluate and implement recommended business process modeling tool providing a central repository of business process models
- Evaluate and implement recommended enterprise architecture tool providing a central repository of business, information, application and infrastructure architectural artifacts
- Evaluate and implement recommended risk and compliance management tool
- Extend the capabilities of the existing data lake through the integration of additional data sources

2.4.1 Additional Activities Identified Post-Commencement

No additional activities identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☒ **Improve Customer Satisfaction**	☒ Deliver a Positive Customer Experience	Indirect
	☒ Increase Service Reliability	Indirect
	☒ Deliver Electricity at Reasonable Prices	Indirect
☒ **Operational Excellence**	☒ Enable Systematic Management of the Business	Indirect

IT OT Collaboration & Analytics

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☒ **System Rebuild & Resiliency**	☒ Effectively Deploy Federal Funding	Indirect
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Reduce risk of safety-related incidents by providing real time access to current work procedures and business processes.

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

Objective: Deliver a Positive Customer Experience

Enables customer service representatives' real time access to business processes ensuring a constant approach to managing.

Objective: Increase Service Reliability

Enhances performance management reporting and dashboard systems to support timely operational decision-making.

Objective: Deliver Electricity at Reasonable Prices

Improved performance metric reporting combined with business process optimization will drive operational efficiencies, thereby controlling costs to ensure more reasonably priced electricity.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Systematic Management of the Business
Objective: Enable Employees to Execute Operations Systematically

Provides access to standardized business processes through a centralized repository.

Reporting on internally established performance metrics drives consistency in delivery of services.

IT OT Collaboration & Analytics

Provides access to standardized work practices to improve employee efficiency.

PRIMARY GOAL: SYSTEM REBUILD & RESILIENCY

Objective: Effectively Deploy Federal Funding

Enhanced analytics reporting capabilities through extension of the data lake to including financial data.

2.6 Program Risks

The primary risk of not proceeding with this program is the continued siloed approach to managing business critical content and the lack of collaboration across the organization. This represents a significant risk in our ability to improve the operations of the utility. The lack of integrated data for analytics will hamper our ability to move to data driven decision making and the lack of effective use of technology to enable our employees to work in a safe manner.

3.0 Program Funding

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.3**	**$0.4**	**$1.7**	**$0.9**
SRP Expenditures	—	—	—	—

3.2 Program Resource Requirements

- Content management consultant
- System integrator
- Data architect
- Systems Analyst

3.3 Estimating Methods & Assumptions

The costs associated with the implementation, upgrade/replacement or expansion of existing technology tools and related processes the was estimated using the IBM Project Cost Estimator for implementing Gartner recognized industry leading solutions. Pricing assumptions are based on the implementation of a medium-large sized enterprise.

Integrated Safety & Operational Management System

1.0 Program Description

LUMA will centralize policy and procedure creation by using a fully integrated, efficiently managed internal safety and operational management system that will allow communication of requirements to all employees and monitor health, safety, and environmental compliance organization wide. The system will have clear operational procedures and controls and will be easy to use and easily updated.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Currently, policies and procedures are decentralized, making it difficult to communicate requirements and monitor compliance. Centralizing policy and procedure creation with automated data collection will allow for easier communication of requirements and monitoring of compliance. Documenting operational procedures will allow for consistency and repeatability and improve employee awareness of requirements and responsibilities.

An Integrated Safety and Operational Management System will allow the company to prioritize safety risks and mitigations across business functions and enable a culture of safety, compliance, and continual improvement, all of which the current organization is falling behind in.

Automating HSE data collection and analysis will allow for improved efficiency and data integrity, particularly as it relates reporting incidents in accordance with legal requirements and to KPIs; the current systems are manual and require significant data manipulation. Use of automated software for data collection is considered industry best practice.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, LUMA will have systems and processes to accurately and consistently track and report incidents. Occupational injuries and illnesses will be reported in compliance with the United States Occupational Safety and Health Act (OSHA) 29 CFR Part 1904 and Puerto Rico OSHA 2 CFR Part 1904. Environmental spills and releases will be reported in compliance with the Emergency Planning and Community Right-to-Know Act 40 CFR 355 and the Clean Water Act 40 CFR 117.

As a result of improved reporting processes, LUMA will be able to accurately and consistently report Safety Performance Metrics outlined in the OMA. Sufficient data will be stored in a software system to provide dashboards and identify trends in safety and environmental data, determine causal factors and root causes and develop corrective actions to allow for continuous improvement.

2.3 Description of Program Completed State

In the completed state, company policies and procedures will be located in a central location and be easily searchable. All processes are documented and regularly updated. Company Health, Safety and Environment (HSE) records will be kept in accordance with statutory requirements.

The software system will be capable of handling additional HSE systems and services, including inspection forms, sustainability metrics, audits, waste tracking and permitting. Systems are automated when possible.

Easy to use systems will be in place to encourage reporting and investigation of incidents and near misses, identification of root causes and trending of corrective actions to proactively identify issues and risks.

2.4 Program Activities

- Implementation of a document library with key company policies and procedures
- Selection, procurement, and implementation of a software system for incident management and corrective action management
- Development of preliminary training materials and completed rollout of systems
- Implementation of policies and procedures supporting software systems and describing data trending and analysis
- Enhancement of selected software to include additional modules
- Software compliance with IT architecture and cybersecurity requirements
- Updating policies and procedures to automation of data collection and analysis
- Development of training programs to orient users on automated systems
- Working with internal groups to ensure systems meet their needs and expectations
- Implementation of additional HSE programming (e.g., human performance, sustainability, internal auditing) based on a cost-benefit analysis and engagement with other departments

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☐ Implement Effective Public Safety Practices	
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	

Integrated Safety & Operational Management System

Primary Goals	Objectives	Direct or Indirect Impact
	☐ Pursue Project Delivery Excellence	
	☒ Enable Employees to Execute Operations Systematically	Direct
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Simple, automated systems will allow for easier identification of root causes and corrective actions to prevent incident and injury recurrence.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Enable Employees to Execute Operations Systematically

Automation will reduce the amount of paperwork and time required to complete reports and investigations.

2.6 Program Risks

- **Contract risk**: Current KPI data collection processes are manual and time-consuming. Maintaining the current system increases likelihood of errors.
- **Compliance risk**: Not documenting key policies and procedures in a centralized location may lead to regulatory non-compliance as it will be difficult to communicate expectations to all employees.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.2**	**$0.3**	**$0.0**	**$0.0**
SRP Expenditures	—	—	—	—

Integrated Safety & Operational Management System

3.2 Program Resource Requirements

- Successful implementation of a commercial off-the-shelf HSE software system.
- A project manager and training for any newly developed software modules.

3.3 Estimating Methods & Assumptions

Integrated Safety and Operational Management System will be based on requirements of associated ISO standards (9001, 14001, 45001).

For software implementation and training costs, estimates were based on implementation costs at parent companies. Cost estimates assume software system will be in service soon after commencement.

3.4 SRP Program Timeline & Milestones



Safety Equipment

1.0 Program Description

To improve employee and public safety LUMA will procure critical safety equipment and associated supplies such as AEDs, portable eye wash, lone worker/confined space entry monitors and audiometric testing equipment. These items critically improve employees' current state of work-related injuries and illnesses as per OSHA requirements and recommendations.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Gap assessments have revealed the following needs in the current state:

- Lone worker/confined space entry monitors to reduce the amount and severity of injuries
- Increased audiometric testing and monitoring in the field to prevent or reduce noise exposure
- Access to AEDs to prevent serious injury and death to workers
- Portable eyewash kits

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

Under the remediated state, LUMA will comply with employer duties under the OSHA Act Section 5 by providing equipment to mitigate hazards that could result in death or serious physical harm to employees. Workers conducting high risk or remote work will have access to required lone worker and confined space entry monitors and audiometric testing, and monitoring equipment and life-saving AEDs. The remediated state will include training for the use of the critical additional safety equipment for workers who regularly conduct high risk or remote work.

2.3 Description of Program Completed State

Under the completed state, all field crews will have access to lifesaving safety equipment when conducting work. The completed program would include the acquisition of additional AEDs and portable eyewashes to ensure they are always available. All field workers will be fully trained and knowledgeable in the proper use and specifications of additional safety equipment and LUMA will be industry-leading in relation to the deployment of safety equipment.

2.4 Program Activities

- Develop strategy on what safety equipment would be a priority based off a risk assessment and health, safety and environmental (HSE) data
- Develop supporting policy documentation to align with specified safety equipment
- Train selected employees on specified equipment care, maintenance, use and inspection

Safety Equipment

- Establishment of policies and procedures that support the use of safety equipment
- Development of inspection and calibration criteria for safety equipment according to manufacturer recommendations
- Development of training programs to orient users on the safety equipment
- Determination of internal groups' needs and expectations

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Direct
	☒ Implement Effective Public Safety Practices	Direct
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☒ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☒ Pursue Project Delivery Excellence	Indirect
	☒ Enable Employees to Execute Operations Systematically	Indirect
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

Providing workers access to potential lifesaving equipment reduces the risk of injury and creates a safer working environment.

Objective: Implement Effective Public Safety Practices

Safety Equipment

Lifesaving equipment will be available for members of the public should an emergency arise.

PRIMARY GOAL: OPERATIONAL EXCELLENCE

Objective: Pursue Project Delivery Excellence

Proper maintenance of equipment purchased will contribute to desired results associated with capital expenditure.

Objective: Enable Employees to Execute Operations Systematically

The workforce will have the supplies to complete work more efficiently and safely.

2.6 Program Risks

Failure to complete this program exposes to LUMA to potential consequences of lifesaving equipment not being available for the public or an employee in a time of emergency (e.g., AEDs).

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.2**	**$0.0**	**$0.0**	**$0.1**
SRP Expenditures	$0.2	$0.0	—	—

3.2 Program Resource Requirements

Requires the purchase of approximately 600 AEDs, 200 portable eyewash units, 50 lone workers/confined space entry monitor devices and 7 sets of audiometric testing equipment.

Requires training on care, use and inspection of safety equipment.

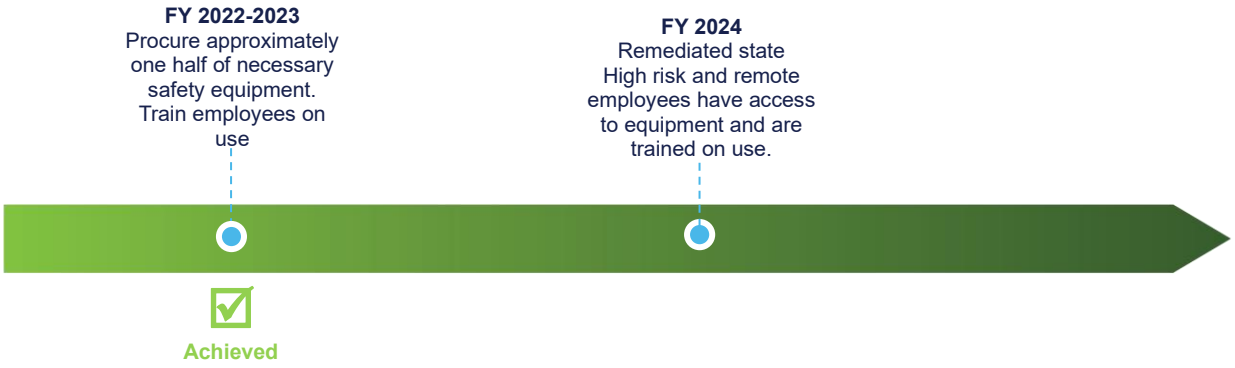
3.3 Estimating Methods & Assumptions

- Used historical purchase prices for the AEDs
  - Assumed a small amount for annual replacement of lost/damaged AEDs.
  - Replacement of batteries every four years (manufacturer specifications).
  - Parent company has seen great success with the use of AEDs on the job site. Since approximately 2011, Quanta Services has saved over 28 lives with the use of AEDs, including both employees and the public.
- Portable eyewash bottles
  - Estimated for placement in large trucks and in hazardous areas such as battery rooms in communications or substations areas.
  - It was noted in job observations that eye wash stations were not readily accessible in hazardous locations.

Safety Equipment

  - There is evidence in historical PREPA incident data (2018-2020) of eye injuries that required the use of eye wash and no evidence to support that any eyewash was available at the time of injury. There have been 16 eye related recordable injuries since 2018.
- Lone workers/confined space monitor devices
  - Monthly fee for use on each device has been accounted for based on historic ATCO data.
  - Increases operational efficiency (replace two workers with one worker with a lone-worker device).
- Audiometric testing equipment
  - This equipment is used to assess noise exposure of worker and supplement the audiometric conservation program.
  - There is evidence in historical PREPA incident data (2018-2020) of hearing loss and noise exposed workers.

3.4 SRP Program Timeline & Milestones



Public Safety

1.0 Program Description

LUMA will introduce an organizational strategy to engage and educate the public on safety around electric equipment and installations, thereby reducing public safety incidents. The program will include the procurement of public safety related materials for training awareness and public outreach, the development and complete roll out of a communications plan and a continuing maintenance plan for the program.

2.0 Program Rationale

2.1 Initial State & Identified Gaps

Currently, there is no organizational strategy for public safety, with limited tracking of public safety incidents. The strategy is needed to reduce the number of safety incidents involving members of the public. Without a public safety strategy there is also no clear organizational direction around public safety communications.

Creating a policy and program for public safety will provide guidance and an overall organizational strategy for engaging with our customers and communities regarding safety around the electrical grid. A public safety strategy will allow for prioritizing risks and mitigations and allow for stakeholder input across business functions (operations, communications, legal, and customer service). Such a strategy should also include implementation of a communications plan to ensure better education and awareness of powerline safety; this will help to reduce public injuries and litigation. Collecting and analyzing public safety related incident data will support better targeted communications.

2.1.1 Additional Gaps Identified Post-Commencement

No additional gaps were identified at this time.

2.2 Description of Remediated State

In the remediated state, LUMA will have measures in place to ensure electrical service can be provided while ensuring public health and safety is protected in accordance with Annex I of the T&D OMA. A program will be established that align with the initiatives and mission of the Electric Safety Foundation International. Public safety incidents that occur will be tracked, investigated, and the information shared within the organization and with the public. The company will initiate an awareness program to engage and educate the public and other government agencies including schools and emergency responders. Summaries of public safety incidents will be shared with emergency agencies and stakeholder interest groups.

As a result of education, there will be fewer and less severe public safety incidents because the public is better informed about the risks of living and working near electrical utilities.

Public Safety

2.3 Description of Program Completed State

In the completed state the company will be able to implement electrical utility public safety best practices to develop and continuously improve initiatives to help promote powerline awareness through communications, education and awareness training. LUMA will work proactively with emergency agencies and stakeholder interest groups in responding to incidents, establishing incident prevention measures, and updating the public safety program.

The effective implementation of the public safety program will result in a further reduction in public safety incidents and litigation. The company will also be actively engaged with the public and other government agencies and participates in joint initiatives to improve public awareness.

2.4 Program Activities

- Establish a comprehensive public safety program and key processes including a communications plan based on incident details and trends
- Train employees on identifying a public safety incident and on reporting requirements
- Report accurate public safety data and analyze for trends
- Develop a presentation to address powerline safety for the public
- Development of displays, training, awareness presentations and other materials aimed at different potential target audiences (schools, emergency responders, contractors, and general public)
- Purchase of visual powerline awareness displays
- Complete regularly public engagement through different venues (advertisements, public notices, and engagement in events)
- Work with internal groups to ensure the public safety program meets their needs and expectations

2.4.1 Additional Activities Identified Post-Commencement

No additional activities were identified at this time.

2.5 Program Benefits

Primary Goals	Objectives	Direct or Indirect Impact
☒ **Prioritize Safety**	☒ Promote a Safe Workplace	Indirect
	☒ Implement Effective Public Safety Practices	Direct
☐ **Improve Customer Satisfaction**	☐ Deliver a Positive Customer Experience	
	☐ Increase Service Reliability	
	☐ Deliver Electricity at Reasonable Prices	
☐ **Operational Excellence**	☐ Enable Systematic Management of the Business	
	☐ Pursue Project Delivery Excellence	
	☐ Enable Employees to Execute Operations Systematically	

Public Safety

Primary Goals	Objectives	Direct or Indirect Impact
☐ **System Rebuild & Resiliency**	☐ Effectively Deploy Federal Funding	
	☐ Restore Damaged Grid Infrastructure	
	☐ Improve Resilience of Vulnerable Infrastructure	
☐ **Sustainable Energy Transformation**	☐ Modernizing the Grid	
	☐ Enable the Digital Transformation	
	☐ Enable the Sustainable Energy Transformation	
☐ **Other**	☐ Other	

PRIMARY GOAL: PRIORITIZE SAFETY

Objective: Promote a Safe Workplace

A comprehensive public safety training and awareness would be given to LUMA contractors to ensure awareness of powerline safety is top of mind. This would be a part of the contractor management requirements as well.

Objective: Implement Effective Public Safety Practices

Educating the public on powerline safety will increase awareness and reduce public incident contacts and litigation claims.

2.6 Program Risks

The following risk areas have been identified:

- **Liability risk:** More awareness and campaigning will increase powerline safety awareness and reduce the frequency and severity of public incidents and litigations, which LUMA could otherwise be liable for.
- **Corporate reputation risk**: More communication, education and public engagement around safety will benefit LUMA's reputation, which may suffer without such engagement.

3.0 Program Funding & Timeline

3.1 Program Funding ($ millions)

Description	2023 Estimate	2024 Estimate	2025 Estimate	2026+ Estimate
Total Expenditures	**$0.1**	**$0.3**	**$0.3**	**$0.1**
SRP Expenditures	$0.1	$0.3	$0.3	—

Public Safety

3.2 Program Resource Requirements

- Successful procurement of visual demonstrations and materials
- Establish communication strategy
- Operational field employees to assist with community engagement
- Interdepartmental coordination of investigations and trending incidents

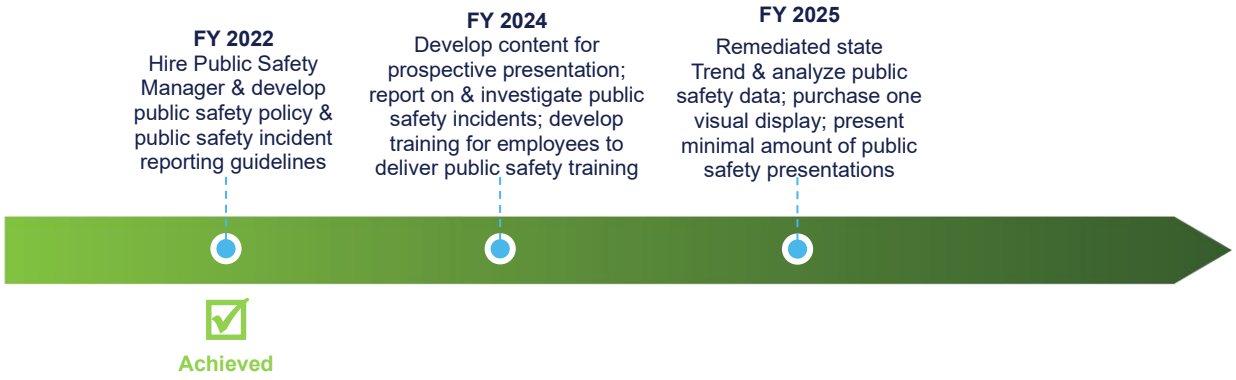
3.3 Estimating Methods & Assumptions

- For equipment and material costs, estimates were based on historical parent company costs.
- Implementation costs were estimated based on operations personnel assisting with community engagement across the island.

We have assumed the following:

- All related communication costs and materials would be in the communications department budget.
- Program development would be completed by two designated employees (Public Safety Manager and Communications Specialist).
- An incident tracking system would be in place to collect, analyze and follow up on public safety related incidents. This information would be used to target audiences for communications and awareness.

3.4 SRP Program Timeline & Milestones



Appendix D: Generation Budget

As per Section 7.3 of the T&D OMA, LUMA is required to submit the Generation Budget as part of its Budget filings. “Operator shall, no later than ninety (90) days prior to the commencement of such Contract Year, submit to Administrator the proposed Budgets for such Contract Year…”, of which Budgets is defined within Section 1.1 to include the Generation Budget. Specifically related to the Generation Budget, “As promptly as practicable in any Contract Year, and sufficiently in advance to allow Operator to comply with the ninety (90) day period set forth above, Owner shall prepare and deliver to Operator the Generation Budget for consolidation with the Operating Budget and the Capital Budgets submitted to Administrator.”

Below is PREPA’s Certfied FY2023 Genco Budget, as certified on July 1, 2022 and submitted by PREPA to LUMA on July 6, 2022. As stated in Section 3.1.1 LUMA is submitting the Annual Budgets, the certified Generation Budget, to P3A simultaneous with submission to PREB.

PREPA GENCO & HOLDCO BUDGET EXPENSES[3]

$ Thousand		FY23 Budget
B. GenCo - Operations & Maintenance Expenses		
Labor		
Salaries & Wages		45,511
Pension & Benefits		28,904
Overtime Pay		11,733
Overtime Benefits		1,395
Total GenCo Labor Operating Expenses		**87,543**
Non-Labor / Other Operating		
Materials & Supplies		19,795
Transportation, Per Diem, and Mileage		1,527
Security		9,043
Utilities & Rents		3,623
Legal Services		7,405
Professional & Technical Outsourced Services		2,392
Regulation & Environmental Inspection		7,945
Other Miscellaneous Expenses		7,565
Total GenCo Non-Labor / Other Operating Expenses		**59,294**
Shared Services Agreement Impact		**59,748**
Total GenCo Operating Expenses		**206,585**
Maintenance		
Generation		99,039
Total GenCo Maintenance Projects Expense		**99,039**
Federal Funding Cost Share		-
Total GenCo Operating & Maintenance Expenses	**$**	**305,624**
C. HoldCo - Operations Expenses		
Labor		
Salaries & Wages		7,513
Pension & Benefits		4,508
Overtime Pay		439
Overtime Benefits		53
Total HoldCo Labor Operating Expenses		**12,513**
Non-Labor / Other Operating Expenses		
Materials & Supplies		288
Transportation, Per Diem, and Mileage		242
Retiree Medical Benefits		9,000
IT Service Agreements		850
Utilities & Rents		36
Communications Expenses		81
Professional & Technical Outsourced Services		4,144
Other Miscellaneous Expenses		1,825
PREPA Restructuring & Title III		25,100
FOMB Advisor Costs allocated to PREPA		24,400
Total HoldCo Non-Labor / Other Operating Expenses		**65,966**
Total HoldCo Operating Expenses	**$**	**78,479**

[3] Total HoldCo Operating Expenses of $78.479 million above include Title III Costs of $25.1 million and FOMB Advisor Costs of $24.4 million which are shown separately by LUMA within Schedule 5.3 Other.

Exhibit 3
Updated Schedules of the Certified Budget in Excel format