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

IN RE: REVIEW OF THE PUERTO RICO ELECTRIC POWER AUTHORITY'S SYSTEM REMEDIATION PLAN	**CASE NO.:** NEPR-MI-2020-0019 **SUBJECT:** Submission of Proposed Modifications to System Remediation Plan and Request for Confidential Treatment.

MOTION SUBMITTING PROPOSED MODIFICATIONS TO SYSTEM REMEDIATION PLAN AND REQUEST FOR CONFIDENTIAL TREATMENT

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:

I. Submission of Proposed Modifications to System Remediation Plan

On February 24, 2021, LUMA filed before this Honorable Puerto Rico Energy Bureau ("Energy Bureau") a Request for Approval of the System Remediation Plan ("SRP Petition"), pursuant to LUMA's obligations under Section 4.1(d) of the Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement dated as of June 22, 2020, executed by and among LUMA, the Puerto Rico Electric Power Authority ("PREPA") and the Puerto Rico Public-Private Partnerships Authority ("P3 Authority") ("T&D OMA").

After several procedural steps, including requests for information and a technical conference to consider LUMA's System Remediation Plan ("SRP"), on June 22, 2021, this Honorable Energy Bureau issued a Resolution and Order approving LUMA's proposed SRP ("June 22nd Order"). Among others, the Energy Bureau determined that "LUMA has developed a

reasonable approach to identify and prioritize both, physical asset deficiencies and business process deficiencies, and has developed initiatives designed to remediate those systems." June 22nd Order at page 37. The Energy Bureau included several reporting requirements. *Id*. at pages 37 and 38.

On page 38 of the June 22nd Order, this Honorable Energy Bureau stated the following:

> The Energy Bureau recognizes that the System Remediation Plan may require revisions in the future, as new or updated information becomes available, and/or as new priorities arises due to new assessments or unforeseeable events. Consequently, consistent with the aforementioned conditions, the Energy Bureau **ORDERS LUMA to file, for Energy Bureau's review and approval, any future proposed modifications (e.g., decrease, abandonment and/or expansions of initiatives) to the conditionally approved System Remediation Plan, prior to the implementation of such modifications.** Such proposal shall include the rationale and justification for the proposed change, a detail explanation and analysis of the impact of such modifications to other initiatives and the overall System Remediation Plan goals.

(emphasis addded).

As Exhibit 1 to this Motion, LUMA is submitting a document that details proposed modifications to several of the SRP improvement programs, which include: consolidations of some of the improvement programs; refinements with updates to the timelines; in a few cases, updates to the scope of the improvement programs; identification of any new gaps and activities; and updates to milestones. As Exhibit 2 to this Motion, LUMA is submitting the SRP improvement programs that include proposed modifications.

II. Request for Confidential Treatment

A portion of the SRP improvement programs that are being submitted with Exhibit 2 to this Motion, includes sensitive commercial information on the resource needs and allocation of funds for future acquisitions that are necessary to implement proposed spending and improvement programs. *See* Section 3.3 (Estimating Methods and Assumptions for Distribution Streetlighting

Program, first and fourth bullets at pages 3-4). Said information should be protected from public disclosure to secure the orderly conduct of proceedings for competitive acquisition of goods and services.

Secondly, several sections of the SRP improvement programs include confidential information in the form of critical energy infrastructure information or critical electric infrastructure information ("CEII") that garners protection from public disclosures pursuant to federal statutes and regulations, *see e.g.,* 6 U.S.C. §§ 671-674; 18 C.F.R. §388.113 (2020), and the Energy Bureau's policy on management of confidential information, *see* the Energy Bureau's Policy on Management of Confidential Information, CEPR-MI-2016-0009, issued on August 31, 2016, as amended on September 21, 2016 ("Energy Bureau's Policy on Management of Confidential Information"). The CEII involves information on safety systems and vulnerabilities of critical system infrastructure that, if disclosed, would expose the electric power grid to attacks to the detriment of the public interest.

In compliance with the Energy Bureau's Policy on Management of Confidential Information, LUMA submits this request and memorandum of law that identifies and explains the legal basis for the confidential treatment of portions of the SRP improvement programs. It is respectfully submitted that the portions of the SRP improvement programs that have been identified as confidential, should be protected per Article 6.15 of Law 57-2014, known as the Puerto Rico Energy Transformation and Relief Act and the Energy Bureau's Policy on Management of Confidential Information.

In furtherance of Act 57-2014's mandate that documents submitted before the Bureau should be kept out of public reach only in exceptional circumstances, this request for confidential designation is narrowly tailored to specifically protect the information that has been identified as

confidential according to applicable law and regulations on CEII and/or sensitive commercial information. LUMA is committed to enrich this proceeding with transparency and to enable the Energy Bureau, interested stakeholders, and customers to fully evaluate and consider the proposed modifications to the SRP for Fiscal Years 2023-25.

A. Applicable Laws and Regulation to submit information confidentially before the Energy Bureau.

Section 6.15 of Act 57-2014 regulates the management of confidential information filed before this Bureau. It provides, in pertinent part, that: "[i]f any person who is required to submit information to the Energy [Bureau] believes that the information to be submitted has any confidentiality privilege, such person may request the Commission to treat such information as such . . . . " 22 LPRA §1054n. If the Energy Bureau determines, after appropriate evaluation, that the information should be protected, "it shall grant such protection in a manner that least affects the public interest, transparency, and the rights of the parties involved in the administrative procedure in which the allegedly confidential document is submitted." *Id.*, Section 6.15 (a).

In connection with the duties of electric power service companies, Sections 1.10 (i) and (ix) of Act 17-2019 further provide that electric power service companies shall submit information requested by customers, except for: (i) confidential information in accordance with the Rules of Evidence of Puerto Rico; […]; and (ix) matters of public security involving threats against PREPA, its property or employees."

Access to the confidential information shall be provided "only to the lawyers and external consultants involved in the administrative process after the execution of a confidentiality agreement." *Id.* Section 6.15(b). Finally, Act 57-2014 provides that this Energy Bureau "shall keep the documents submitted for its consideration out of public reach only in exceptional cases. In these cases, the information shall be duly safeguarded and delivered exclusively to the personnel

of the [Energy Bureau] who needs to know such information under nondisclosure agreements. However, the [Energy Bureau] shall direct that a non-confidential copy be furnished for public review". *Id.* Section 6.15(c).

The Energy Bureau's Policy on Confidential Information details the procedures that a party should follow to request that a document or portion thereof, be afforded confidential treatment. In essence, the Energy Bureau's Policy on Confidential Information requires identification of the confidential information and the . . . filing of a memorandum of law explaining the legal basis and support for a request to file information confidentially. *See* CEPR-MI-2016-0009, Section A, as amended by the Resolution of September 16, 2016, CEPR-MI-2016-0009. The memorandum should also include a table that identifies the confidential information, a summary of the legal basis for the confidential designation and a summary of the reasons why each claim or designation conforms to the applicable legal basis of confidentiality. *Id.* paragraph 3. The party who seeks confidential treatment of information filed with the Energy Bureau must also file both "redacted" or "public version" and an "unredacted" or "confidential" version of the document that contains confidential information. *Id.* paragraph 6.

The Energy Bureau's Policy on Confidential Information also states the following with regards to access to validated Trade Secret Information and CEII:

> 1. Trade Secret Information
>
> Any document designated by the [Energy Bureau] as Validated Confidential Information because it is a trade secret under Act 80-2011 may only be accessed by the Producing Party and the [Bureau], unless otherwise set forth by the [Bureau] or any competent court.
>
> 2. Critical Energy Infrastructure Information ("CEII")
>
> The information designated by the [Energy Bureau] as Validated Confidential Information on the grounds of being CEII may be accessed by the parties' authorized representatives only after they have executed and delivered the Nondisclosure Agreement.

> Those authorized representatives who have signed the Non-Disclosure Agreement may only review the documents validated as CEII at the [Energy Bureau] or the Producing Party's offices. During the review, the authorized representatives may not copy or disseminate the reviewed information and may bring no recording device to the viewing room.

Id. Section D (on Access to Validated Confidential Information).

Relatedly, Energy Bureau Regulation No. 8543, *Regulation on Adjudicative, Notice of Noncompliance, Rate Review, and Investigation Proceedings*, includes a provision for filing confidential information in adjudicatory proceedings before this Honorable Bureau. To wit, Section 1.15 provides that, "a person has the duty to disclose information to the [Bureau] considered to be privileged pursuant to the Rules of Evidence, said person shall identify the allegedly privileged information, request the [Energy Bureau] the protection of said information, and provide supportive arguments, in writing, for a claim of information of privileged nature. The [Bureau] shall evaluate the petition and, if it understands [that] the material merits protection, proceed accordingly to . . . Article 6.15 of Act No. 57-2015, as amended." *See also* Energy Bureau Regulation No. 9137 on *Performance Incentive Mechanisms,* Section 1.13 (addressing disclosure before the Energy Bureau of Confidential Information and directing compliance with Resolution CEPR-MI-2016-0009).

B. Grounds for Confidentiality

1. Sensitive Commercial Information

Under the Industrial and Trade Secret Protection Act of Puerto Rico, Act 80-2011, 10 LPRA §§ 4131-4144, industrial or trade secrets are deemed to be any information:

> (a) That has a present or a potential independent financial value or ***that provides a business advantage***, insofar as such information is not common knowledge or readily accessible through proper means

> by persons who could make a monetary profit from the use or disclosure of such information, and
> (b) for which reasonable security measures have been taken, as circumstances dictate, to maintain its confidentiality.

Id. §4131, Section 3 Act. 80-2011. (Emphasis added).

Trade secrets include, but are not limited to, processes, methods and mechanisms, manufacturing processes, formulas, projects or patterns to develop machinery and lists of specialized clients that may afford an advantage to a competitor. *See* Statement of Motives, Act 80-2011. As explained in the Statement of Motives of Act 80-2011, protected trade secrets include any information bearing commercial or industrial value that the owner reasonably protects from disclosure. *Id. See also* Article 4 of Puerto Rico's Open Data Law, Act 122-2019 (exempting the following from public disclosure: (1) commercial or financial information whose disclosure will cause competitive harm; (2) trade secrets protected by a contract, statute or judicial decision (3) private information of third parties). *See* Act 122-2019, Articles 4 (ix) and (x) and (xi)).

The Puerto Rico Supreme Court has explained that the trade secrets privilege protects free enterprise and extends to commercial information that is confidential in nature. *Ponce Adv. Med. v. Santiago Gonzalez,* 197 DPR 891, 901-02 (2017) (citation omitted); *see also Next Step Medical Co. v. MCS Advantage Inc.,* 2016 WL 6520173, KLCE201601116 (P.R. Court of Appeals, September 13, 2016 at page 11 (holding that in Puerto Rico, what constitutes trade secrets is evaluated applying a broad definition). A trade secret includes ***any and all information*** from which a real or potential value or economic advantage may be derived; that is not common knowledge or accessible through other means; and as to which reasonable security measures have been adopted to keep the information confidential. *Ponce Adv. Medical*, 197 DPR at 906.

Sections 3.3 of the Distribution Streetlighting improvement program, first and fourth bullets at pages 3-4, includes sensitive commercial information involving future acquisitions that may be

conducted through public procurements. Said information should be protected from disclosure to secure the orderly conduct of future competitive procurement processes and to avoid granting unfair advantages to suppliers and/or potential proponents of bidders.

On page 5 of a Resolution and Order dated April 29, 2021 issued in Case NEPR-MI-2021-0004, with the subject *Request for Partial Reconsideration of Determinations on LUMA's Request for Confidential Treatment and Designations of Portions of Appendix D and of documents and attachments of Responses to Requests for Information to Initial Budget,* this Energy Bureau granted confidential designation to the same information that is included in portions of Section 3.3 of the Distribution Streetlighting improvement program. LUMA hereby requests that the Energy Bureau apply said prior ruling on confidentiality to the same sensitive commercial information that was submitted in connection with LUMA's SRP.

It is respectfully submitted that the aforementioned portion of Section 3.3 of the Distribution Streetlighting improvement program, first and fourth bullets at pages 3-4, reveals processes and estimations that are key to LUMA's operations and success under the OMA. It provides details on specific resources that LUMA proposes to acquire for several of the SRP improvement programs, including assumption on costs, specifications of materials and goods, and explanations on the needs. Premature disclosure of this information would contravene public policy on competitive procurement processes and will impede efficient allocation of PREPA funds that have been earmarked to be invested in improvement programs that would be funded over the next three years to deliver value to customers in accordance with policy and contractual requirements and within annual budget constraints.

2. Critical Energy/Electric Infrastructure Information (CEII)

Portions of two of the SRP improvement programs that are submitted with Exhibit 2, reference critical energy infrastructure information that, under relevant Federal Law and Regulations, is protected from public disclosure and receives confidential treatment. As mentioned above, the Energy Bureau's Policy on Management of Confidential Information, provides for management of CEII, and directs that information validated as CEII shall be accessed by the parties' authorized representatives only after they have executed and delivered a Nondisclosure Agreement.

Generally, CEII or critical infrastructure information is exempted from public disclosure because it involves assets and information the disclosure of which poses public security, economic, health and safety risks. Federal Regulations on CEII, particularly, 18 C.F.R. § 388.113, states that:

> Critical energy infrastructure information means specific engineering, vulnerability, or detailed design information about proposed or existing critical infrastructure that:
>
> (i) Relates details about the production, generation, transportation, transmission, or distribution of energy;
>
> (ii) Could be useful to a person in planning an attack on critical infrastructure;
>
> (iii) Is exempt from mandatory disclosure under the Freedom of Information Act, 5 U.S.C. 552; and
>
> (iv) Does not simply give the general location of the critical infrastructure.

Id.

Additionally, "[c]ritical electric infrastructure means a system or asset of the bulk-power system, whether physical or virtual, the incapacity or destruction of which would negatively affect national security, economic security, public health or safety, or any combination of such matters. *Id.* Finally, "[c]ritical infrastructure [("CI")] means existing and proposed systems and assets, whether physical or virtual, the incapacity or destruction of which would negatively affect security, economic security, public health or safety, or any combination of those matters." *Id.*

The Critical Infrastructure Information Act of 2002, 6 U.S.C. §§ 671-674 (2020), which is part of the Homeland Security Act of 2002 provides protection from public disclosure of critical infrastructure information. CII is defined as "information not customarily in the public domain and related to the security of critical infrastructure or protected systems...." 6 U.S.C. § 671 (3).[1]

The following improvement programs include CEII, that, if disclosed to the public, will expose key assets to security vulnerabilities or attacks by persons seeking to cause harm to the systems. In a Resolution and Order of April 23, 2021 entitled *Determination on LUMA's Request*

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[1] Regarding protection of voluntary disclosures of critical infrastructure information, 6 U.S.C. § 673, provides in pertinent part, that CII:

(A) shall be exempt from disclosure under the Freedom of Information Act;

(B) shall not be subject to any agency rules or judicial doctrine regarding ex parte communications with a decision making official;

(C) shall not, without the written consent of the person or entity submitting such information, be used directly by such agency, any other Federal, State, or local authority, or any third party, in any civil action arising under Federal or State law if such information is submitted in good faith;

(D) shall not, without the written consent of the person or entity submitting such information, be used or disclosed by any officer or employee of the United States for purposes other than the purposes of this part, except—

(i) in furtherance of an investigation or the prosecution of a criminal act; or

(ii) when disclosure of the information would be--

(I) to either House of Congress, or to the extent of matter within its jurisdiction, any committee or subcommittee thereof, any joint committee thereof or subcommittee of any such joint committee; or

(II) to the Comptroller General, or any authorized representative of the Comptroller General, in the course of the performance of the duties of the Government Accountability Office

(E) shall not, be provided to a State or local government or government agency; of information or records;

(i) be made available pursuant to any State or local law requiring disclosure of information or records;

(ii)otherwise be disclosed or distributed to any party by said State or local government or government agency without the written consent of the person or entity submitting such information; or

(iii)be used other than for the purpose of protecting critical Infrastructure or protected systems, or in furtherance of an investigation or the prosecution of a criminal act.

(F) does not constitute a waiver of any applicable privilege or protection provided under law, such as trade secret protection.

for Confidential Designations and Treatment of Exhibit 1 of the February 24, 2021 Filing ("April 23rd Order"), this Energy Bureau granted confidential designation to the following improvement programs, finding that the relevant portions included CEII that should be protected from disclosure. LUMA asks that the Energy Bureau follow its prior ruling and accept the following improvement programs and discrete portions of the SRP Improvement Programs confidentially:

i. IT OT Telecom Systems & Networks, pages 37-43

This improvement program includes Information Technology (IT) and Operational Technology ("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 out all of PREPA's IT and OT data. They are, therefore, part of the critical infrastructure to operate the electrical grid safely and responsibly.

Section 2.1 includes a description of the technology currently available on network connectivity and Telecom protection. *See* page 37. Sections 2.2, 2.3, and 2.4 of the IT OT Telecom Systems & Networks program provide content on the program for remediation, including the activities to be conducted which in this program involves three steps. *Id.* at pages 38-40. Additionally, Section 2.5 describes the benefits of the program with reference to the primary goals, objectives and impact, and Section 2.6 identifies the risks of delaying the program because it is a key component of protecting people, property and equipment. *Id.* at pages 40-43. The aforementioned sections also reference cybersecurity vulnerabilities. All of this information should be kept confidentially, as it involves critical infrastructure and provides LUMA's assessment of its vulnerabilities and how and why to address them with regards to the IT and OT Systems and Networks.

ii. Substation Security, pages 58-61[2]

This improvement program combines the Physical Security for Distribution Facilities and Transmission Substation Security programs that were approved by this Energy Bureau on June 22, 2021. In the April 23rd Order, this Energy Bureau granted confidential treatment to several portions of these two programs.

The Substation Security Program focuses on a variety of security concerns at transmission and distribution substations which are critical to operate the system and provide safe and reliable services. It will replace and add new security technology and hardware to deter, detect and delay security incidents.

Sections 2.1, 2.2, 2.3, and 2.4 of the Substation Security improvement program provide content on the program for remediation, including the activities to be conducted and the types of measures to be implemented to protect assets, employees and the public. *Id.* at pages 58-59. Additionally, Section 2.5 describes the benefits of the program with reference to the primary goals, objectives and impact, and Section 2.6 identifies the risks of failing to implement adequate security measures. *Id.* at pages 59-61. This information should be kept confidentially, as it involves critical infrastructure and provides LUMA's assessment on vulnerabilities and how to address them to provide security in distribution facilities. It bears noting that this Energy Bureau has kept proceedings on physical security plan, confidentially. *See In re Review of the Puerto Rico Electric Power Authority Physical Security Plan,* NEPR-MI-2020-0018.

[2] The proposed revised SRP Improvement Programs combine the Physical Security for Distribution Facilities and Transmission Substation Security program briefs into the Substation Security Improvement Program.

III. Identification of Confidential Information

In compliance with the Energy Bureau's Policy on Management of Confidential Information, a table summarizing the hallmarks of this request to submit portions of the SRP Improvement Programs confidentially. The portions of the SRP improvement programs that are identified below, will be submitted for the public record in redacted form to obscure the 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**
Ex **Distribution Streetlighting Improvement Program**	Distribution Streetlighting, Section 3.3; First and Fourth Bullet at pages 4-5	April 13, 2021	Sensitive Commercial Information and Trade Secrets under Act 80-2011	Section II of this Memorandum discusses and shows that the specified portions of the SRP Improvement Program includes information for future acquisitions of good and services that may provide unfair advantages to suppliers or proponents and could harm the public interest.
Exhibit 2 Annual Budgets **IT OT Telecom Systems & Networks**	Sections 2.1 -2.6, Pages 37-43	April 13, 2021	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section II of this Memorandum provides the legal basis to establish that that the specified portions of the SRP Improvement Program includes confidential information.

Exhibit 2 Annual Budgets **Substation Security**	Sections 2.1 -2.6, Pages 58-61	April 13, 2021	Critical Energy Infrastructure Information 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674	Section II of this Memorandum provides the legal basis to establish that that the specified portions of the SRP Improvement Program includes confidential information.

WHEREFORE, LUMA respectfully requests that the Bureau **take notice** of the aforementioned, **consider and approve** the proposed changes to the SRP and **grant** the request for confidential treatment.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 14th day of April, 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 motion to the attorneys for PREPA, Joannely Marrero-Cruz, jmarrero@diazvaz.law; and Katiuska Bolaños-Lugo, kbolanos@diazvaz.law.

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Exhibit I
Proposed Modifications to the System Remediation Plan

Exhibit 1: Proposed Modifications to the System Remediation Plan

Annual Update

April 14, 2022

System Remediation Plan

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Tables & Figures

List of Acronyms

Acronym	Definition
BP&D	Bill Print & Delivery
CC&B	Customer Care and Billing
COR3	Central Office for Recovery, Reconstruction and Resiliency
DSO	Day Sales Outstanding
FEMA	Federal Emergency Management Agency
FET	Front-End Transition
FY	Fiscal Year
GenCo	Generation Company
GridCo	Grid Company
HoldCo	Holding Company
HR	Human Resources
IT OT	Information Technology/ Operational Technology
KPI	Key Performance Indicators
O&M	Operations and Maintenance
OMS	Outage Management System
OPGW	Optical Ground Wire
OSHA	Occupational Safety and Health Administration
OT	Operational Technology
P3A	Puerto Rico Public-Private Partnerships Authority
PBX	Private Branch Exchange
PCI	Payment Card Industry
P&C	Protection and Control
PMI	Project Management Institute
PMO	Project Management Office
PREB	Puerto Rico Energy Bureau
PREPA	Puerto Rico Electric Power Authority
PUP	Prudent Utility Practice
PV	Photovoltaic
RAS	Remedial Action Schemes
SOW	Scope of Work
SRP	System Remediation Plan
T&D	Transmission and Distribution

System Remediation Plan

Acronym	Definition
T&D OMA	Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement
T&G	Transmission and Generation

System Remediation Plan

1.0 Introduction

As required by the Puerto Rico Energy Bureau (PREB or the Bureau) in the resolution and order dated June 22, 2021, under docket NEPR-MI-2020-0019, this document includes a summary of the proposed modifications to the System Remediation Plan (SRP) for Fiscal Year 2023 through 2025 submitted for the Bureau's review and approval in the Annual Budget filing for Fiscal Year 2023.

The proposed modifications to the SRP contained herein are presented pursuant to the approved Transmission and Distribution Operations 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 ServCo) (LUMA Energy and LUMA Servco, together LUMA) and dated as of June 22, 2020.

The purpose of the SRP is to provide an appropriate transition from the current state where utility assets and activities are not compliant with Contract Standards, including Prudent Utility Practice, to one where the minimum conditions are met for Contract Standards, including Prudent Utility Practice. This transition is specific to the identified activities and assets and, as such, will end based on the attainment of certain milestones identified in the SRP specific to those assets and activities.

2.0 SRP Progress

During the first ten months of operations, LUMA's more than 3,000 hard-working men and women have continued to build a more reliable, more resilient and more customer-focused and cleaner energy system for our customers and all of Puerto Rico. 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

After 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 and the SRP submitted to the Energy Bureau in February 2021, LUMA detailed the findings from its assessments of PREPA's assets and operations carried out 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.

System Remediation Plan

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 System 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. LUMA's early actions include 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. Nevertheless, these obstacles are materially impacting LUMA's Annual Budgets for fiscal years 2023 through 2025 and have resulted in modifications to LUMA's SRP.

3.0 Proposed Modifications to the SRP

LUMA has updated our improvement programs to reflect the unexpected deficiencies and omissions discovered upon commencement and the impact of PREPA's inaction on preliminary planning and engineering during the first five months of calendar 2021. Changes were made to some timelines and a few improvement programs required scope changes. Briefs were deleted for those programs that have been completed or whose scope has been consolidated into another program.

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 to align with 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)
- Substation Reliability (Combining Transmission Substation Reliability Improvements and Distribution Substation Reliability Improvements) – Not part of the SRP
- 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)

In the past 10 months, four of LUMA's SRP improvement programs have reached remediated state and, as of Fiscal Year 2023, will no longer be included as part of the SRP. These programs include the following:

- Modernize Customer Service Technology
- Critical System Operation Strategy and Processes
- Human Resources (HR) Programs
- Integrated Safety & Operational Management System

These improvement programs will proceed with various improvement activities, as outlined in our Annual Budgets filing, but will no longer include remediation activities as all remediation requirements outlined as part of these improvement programs have been achieved.

LUMA is presenting, as part of this filing, those SRP improvement programs with updated gaps, activities or milestones. For copies of all of LUMA's improvement programs, please refer to LUMA's Annual Budgets filing for Fiscal Year 2023, Case NEPR-MI-2021-0004. The Annual Budgets filing includes all improvement program briefs and summarizes all changes that have been proposed for Fiscal Year 2023.

For changes made to SRP programs, Table 3-1 below outlines the updates to each SRP improvement program including: identifying any new gaps and activities, updates made to milestones and the description of these changes. Note that a check mark in the table below indicates that the corresponding portion of the SRP improvement program brief has been updated. Exhibit 2 contains copies of SRP programs with a proposed modification.

Unless otherwise noted, LUMA does not anticipate that modifications outlined in the table below will impact other improvements programs or LUMA's overall goals.

System Remediation Plan

Table 3-1. Improvement Program Changes for FY 2023

Improvement Program	Updated Gaps or Activities	Updated Milestones	Description of Changes and Rationale
Customer Experience			
Distribution Streetlighting		✓	Milestones have been updated to reflect the approach used to manage the work.
Billing Accuracy & Back Office		✓	Delay in remediated state due to increase in anticipated SOW.
Streetlight Billing		✓	Milestones have been delayed because streetlight data collection is a pre-requisite for this program to continue with activities.
Distribution			
Distribution Pole and Conductor Repair		✓	Milestones have been updated to reflect the time required to complete the work.
Distribution Lines Assessment		✓	Milestones have been updated to reflect the time required to complete the work.
Transmission			
Transmission Line Rebuild		✓	Milestones have been updated to reflect the delay in obtaining federal funds.
IT OT Telecom Systems & Network	✓	✓	Milestones have been updated to reflect the delay in obtaining federal funds.
Transmission Priority Pole Replacements		✓	Milestones have been updated to reflect the time required to complete the work.
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 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.

System Remediation Plan

Improvement Program	Updated Gaps or Activities	Updated Milestones	Description of Changes and Rationale
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 optimize federal funding opportunities and to take advantage of efficiencies by conducting activities at the same time under the same projects and program. Milestones have been updated to align with the most current estimated timelines associated with obtaining federal funding.
Control Center & Buildings			
Facilities Development & Implementation		✓	Milestones have been updated to align with the most current estimated timelines associated with obtaining federal funding.
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. The milestones have been updated to align with the work that needs to be completed.
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 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.
T&D Fleet		✓	Reduction in total vehicle count due to exclusion of GenCo and HoldCo vehicles from scope of program. Realignment of vehicles counts to new category descriptions. Delay in remediated state due to higher number of unusable vehicles than originally anticipated.
Permits Processes & Management	✓		Additional gaps and activities identified since June 1 have been included.

System Remediation Plan

Improvement Program	Updated Gaps or Activities	Updated Milestones	Description of Changes and Rationale
Support Services			
Update to Third Party Use, Audit, Contract and Billing Procedures		✓	Milestones have been delayed because streetlight data collection is a pre-requisite for this program to continue with activities.
Critical Financial Controls		✓	Milestones have been refined to reflect the most current estimated timeline.

Exhibit II
SRP Programs with Proposed Modifications

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:

- 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.

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

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

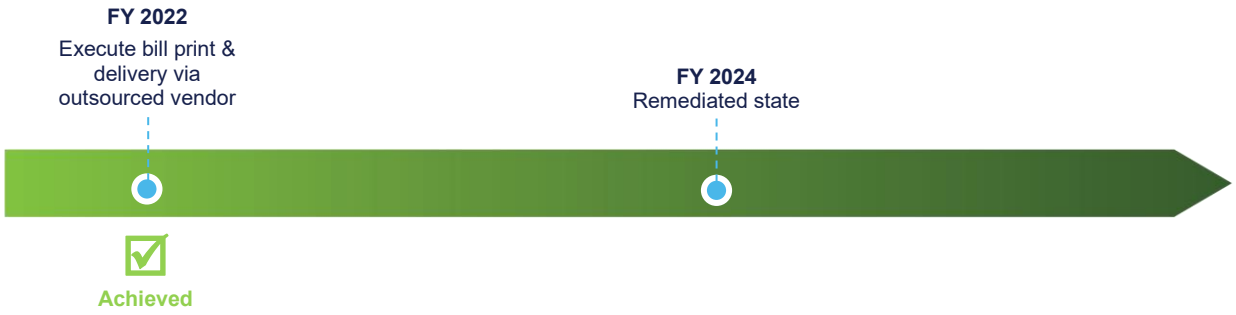
The BP&D vendor successfully launched the outsourced third party function at LUMA commencement.

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



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.

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

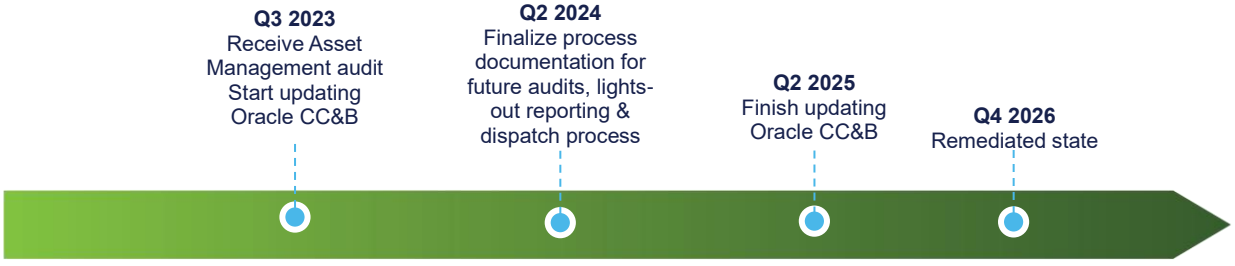
- Customer Experience Representatives
- A scan of the data entered the asset and GIS databases
- A scan of all public lighting and billing data from the CC&B system

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



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.

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 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,

- 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.

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

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).

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.

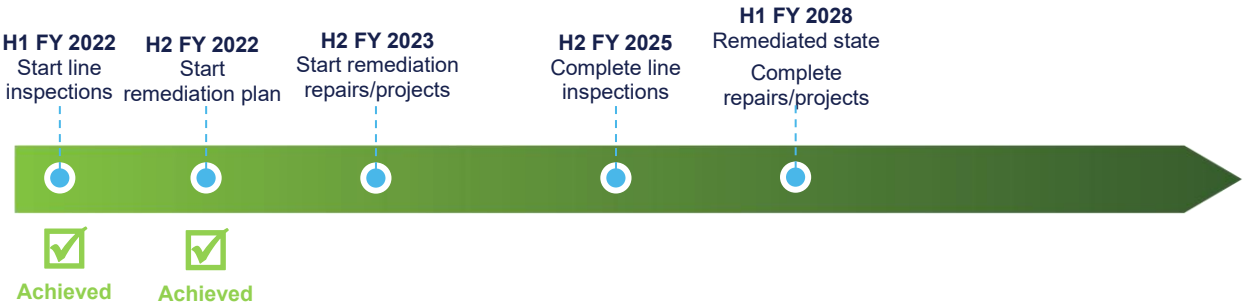
38 kV line rebuilds: Average cost $1.172m per mile. $80m year in one including labor. Average of $121.3m/year for subsequent years. 10-year program with high priority items addressed within the first three years. Unit pricing breakdown for 100% replacement of components (per mile):

- 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



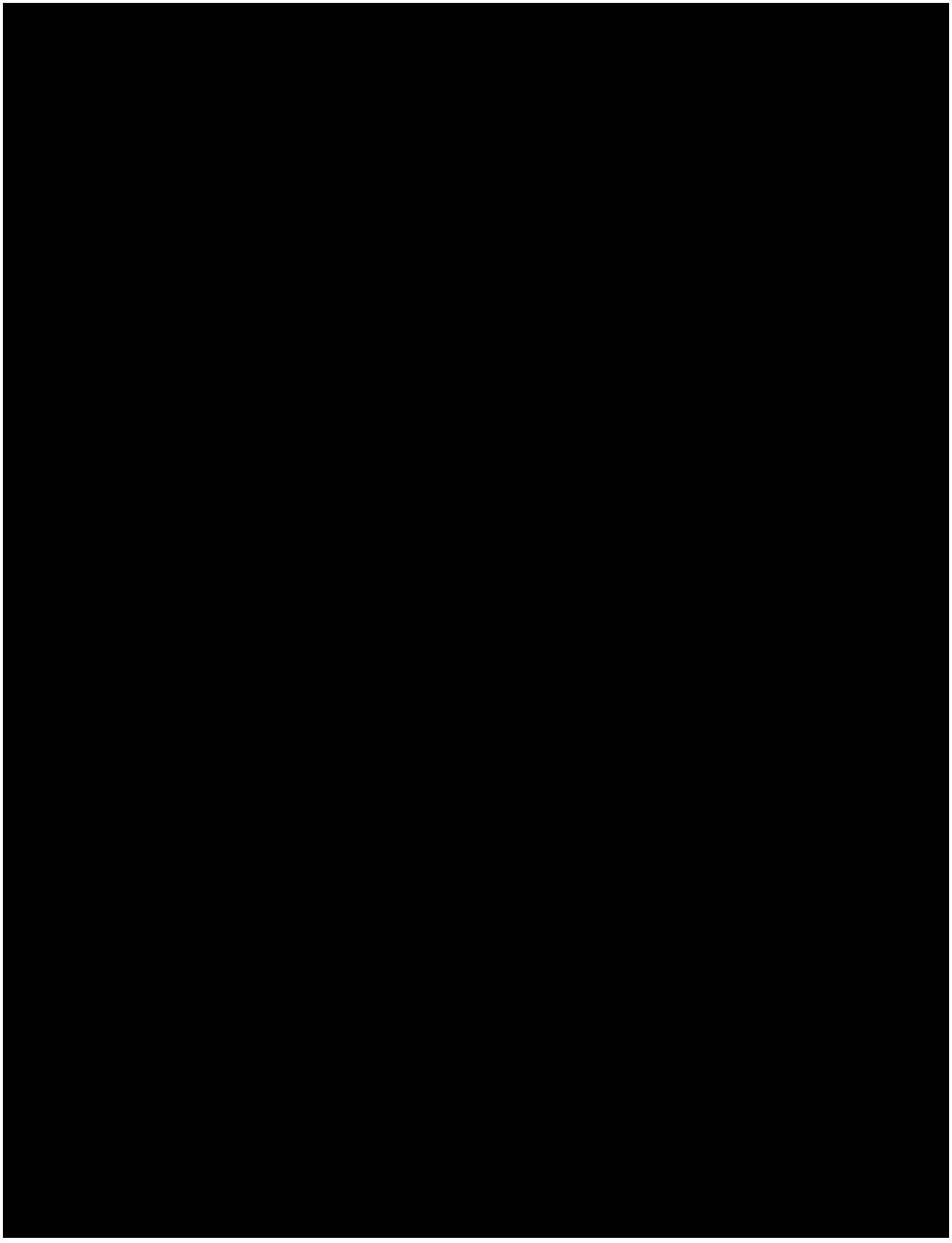
IT OT Telecom Systems & Networks

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.

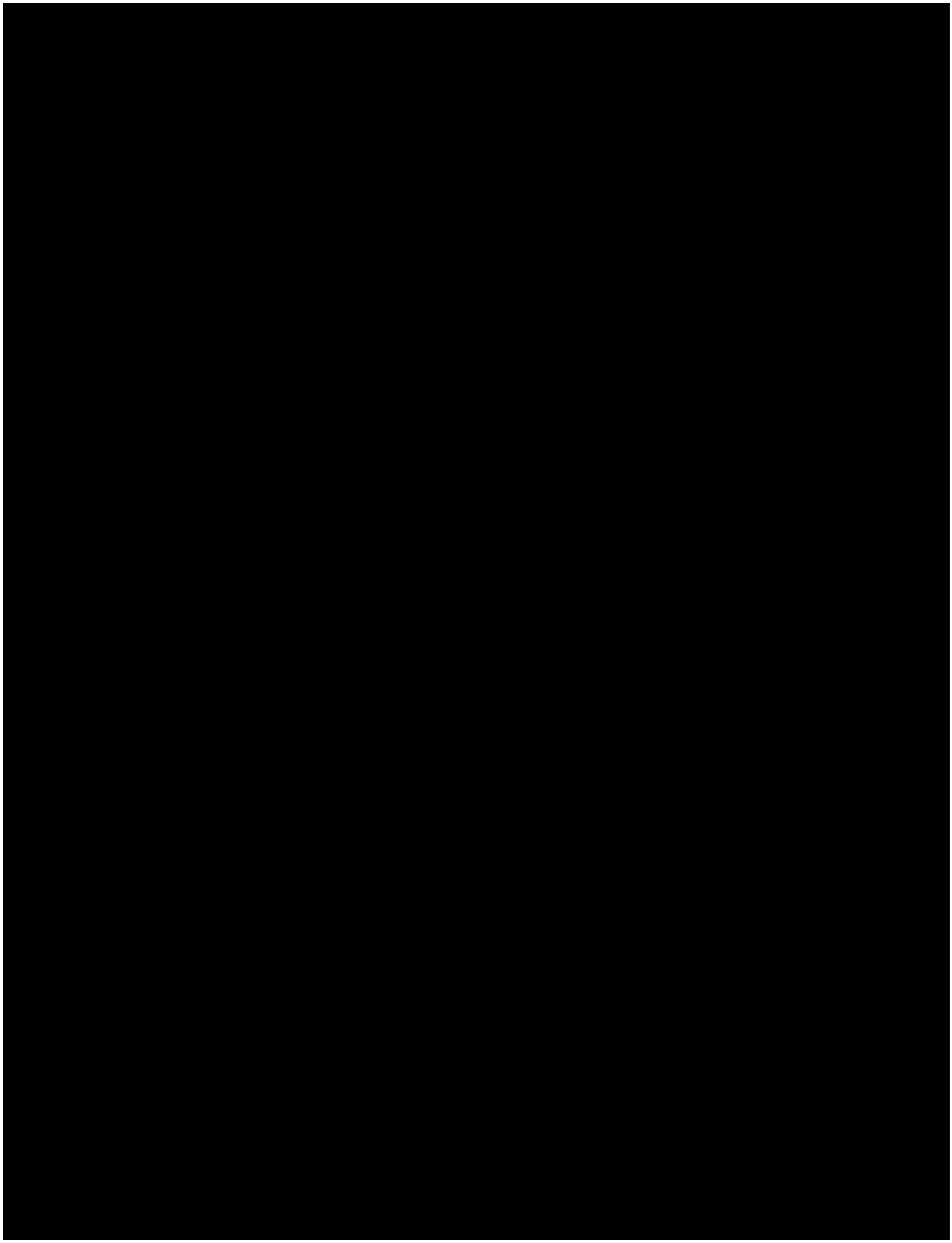
2.0 Program Rationale

IT OT Telecom Systems & Networks

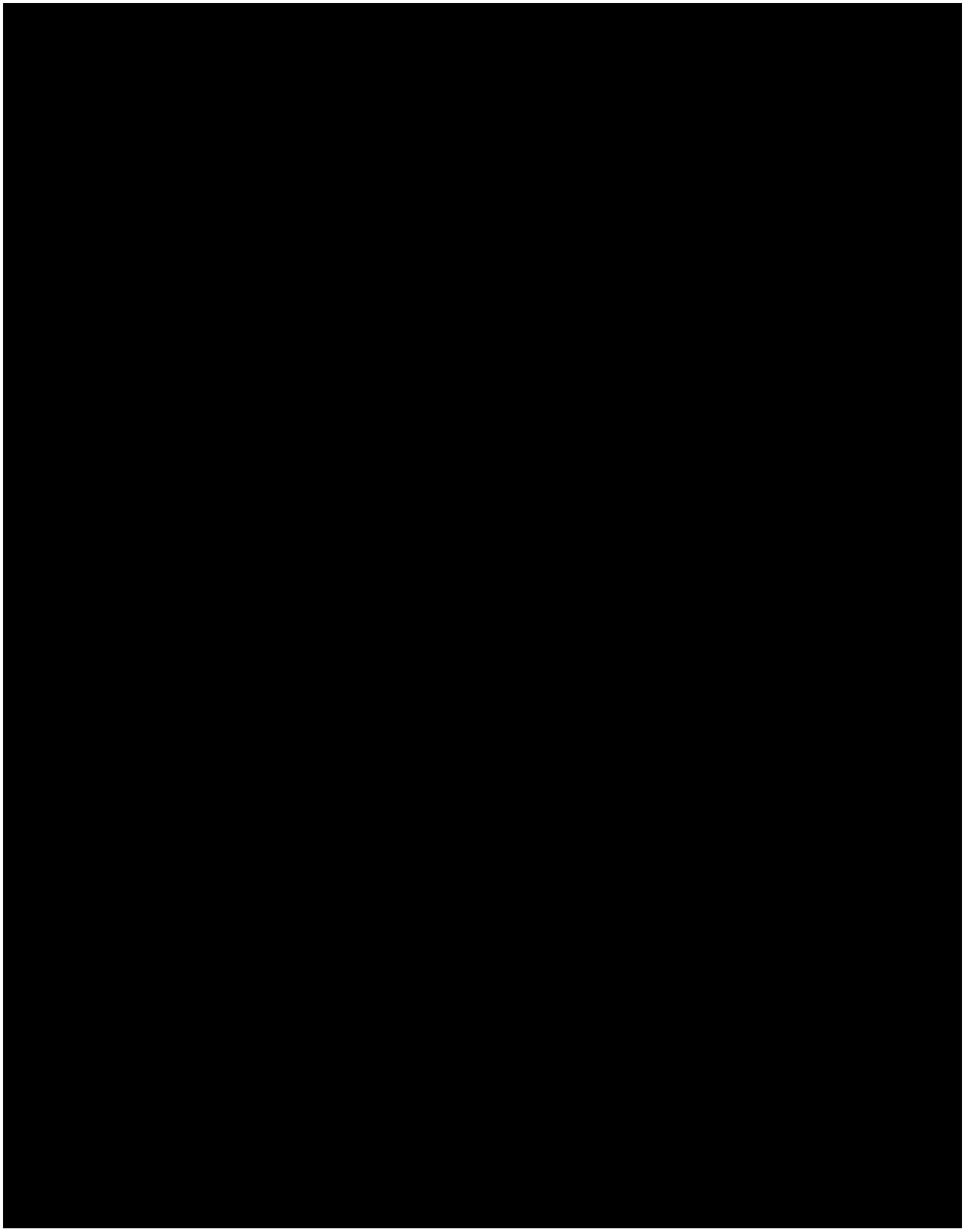


TRANSMISSION PORTFOLIO – SYSTEM REMEDIATION PLAN PROGRAM

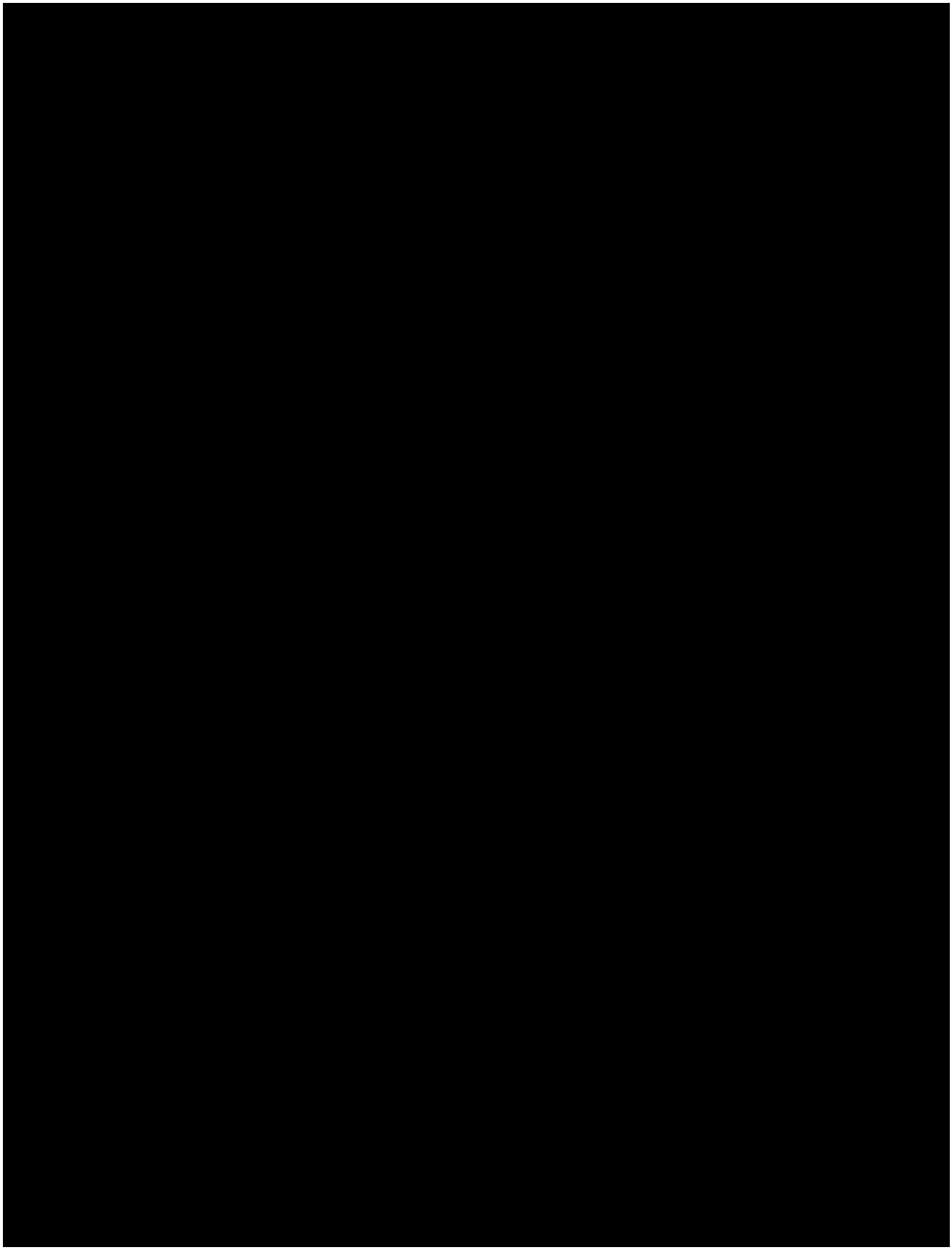
IT OT Telecom Systems & Networks



IT OT Telecom Systems & Networks

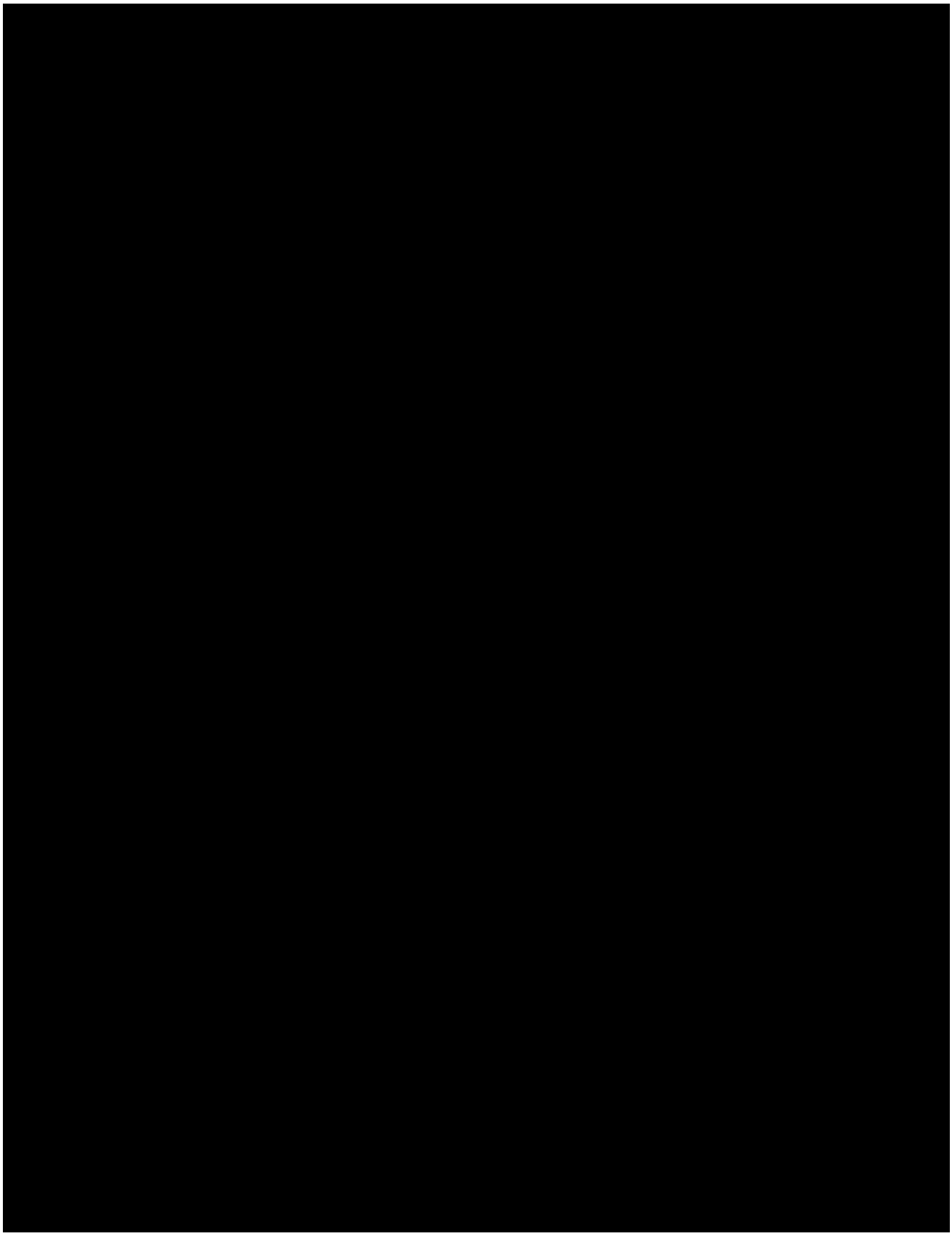


IT OT Telecom Systems & Networks



TRANSMISSION PORTFOLIO – SYSTEM REMEDIATION PLAN PROGRAM

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.

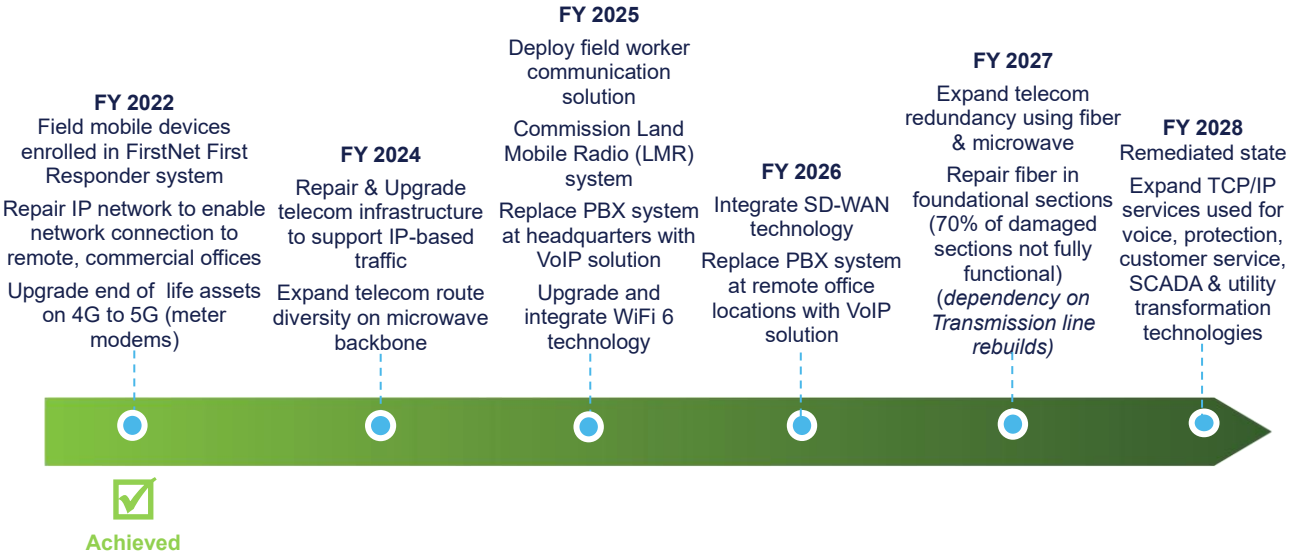
Further verification of funding was done using IBM and additional LUMA and parent company resources.

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

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

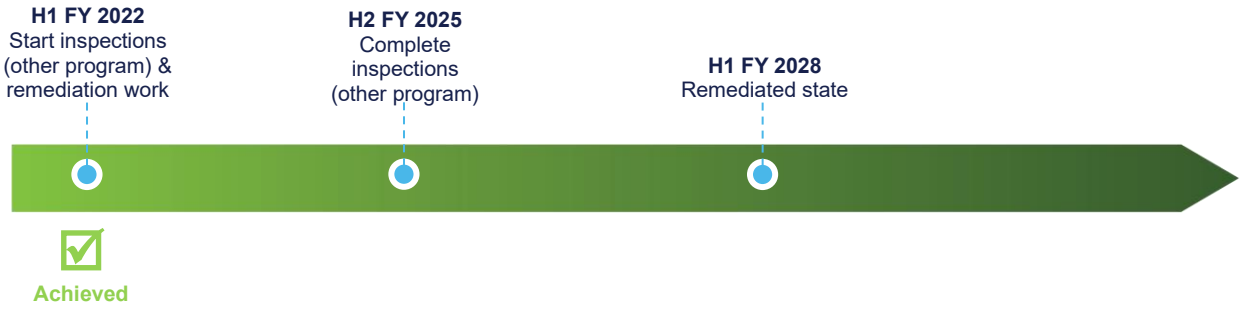
- Approximately 8,100 structures and associated hardware/conductor for 10,000 structures falls into this work scope.
- Work expected to be mainly performed by on-island resources.

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



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

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

- 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:

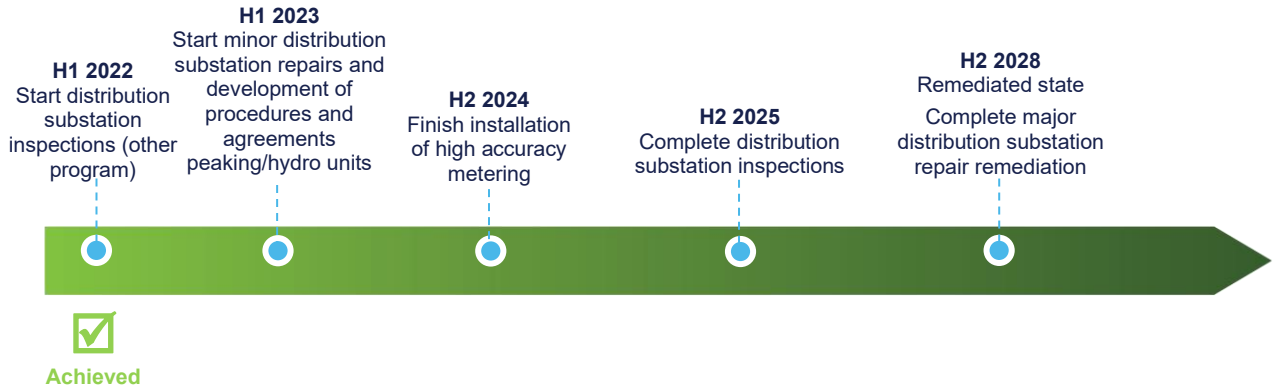
Substation Rebuilds

- 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

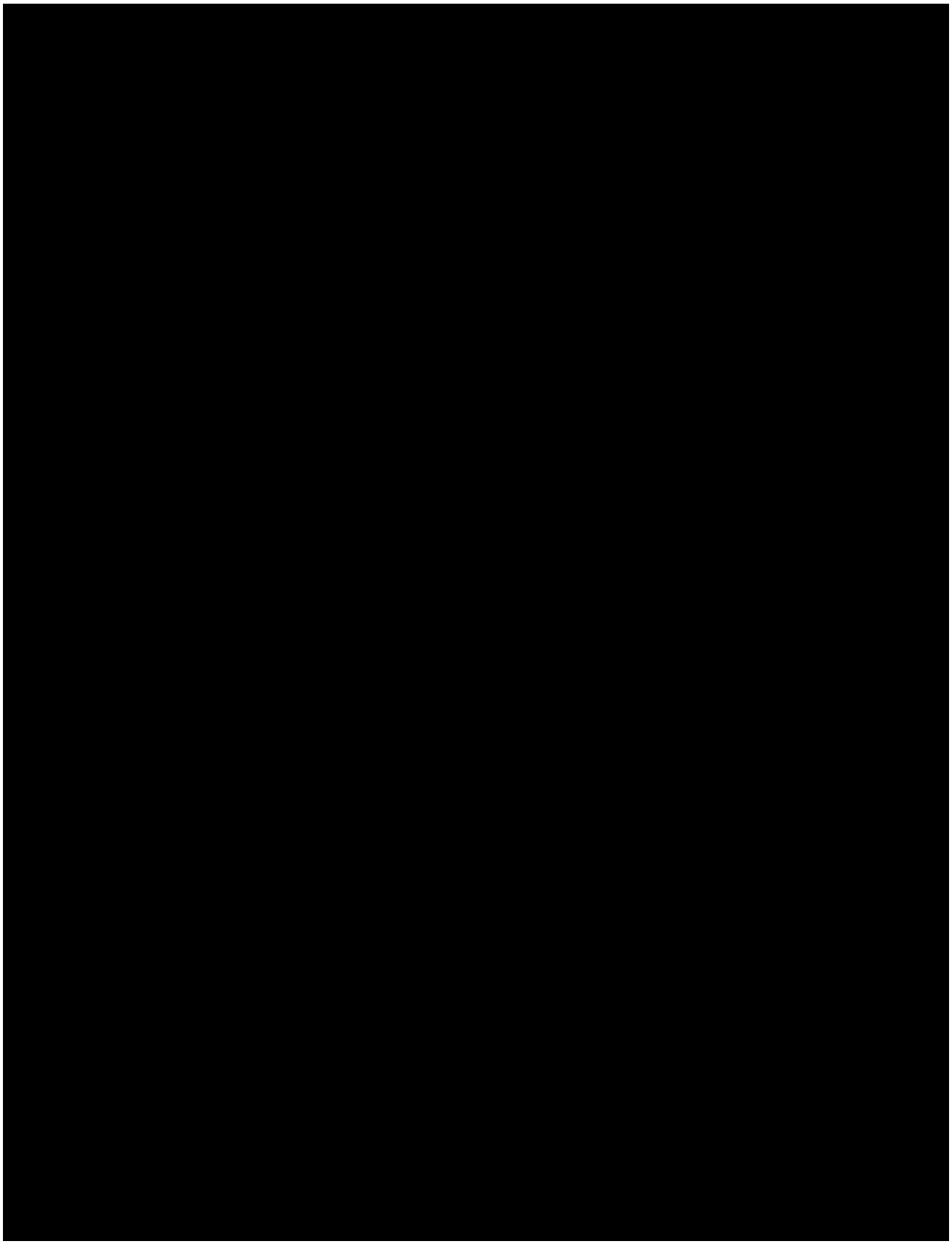
1.0 Program Description

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.

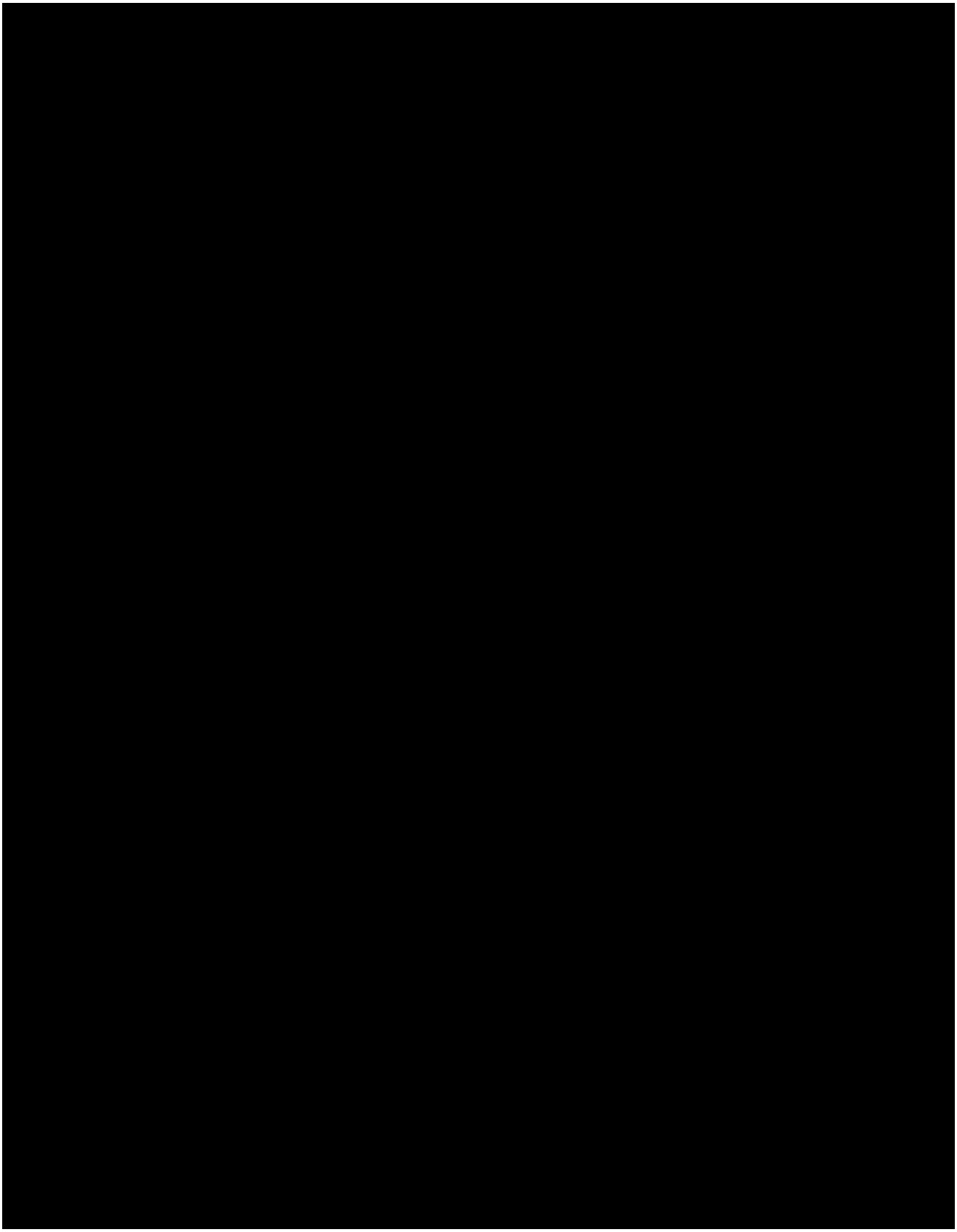
2.0 Program Rationale

[redacted]

Substation Security



Substation Security



Substation Security

PRIMARY GOAL: IMPROVE CUSTOMER SATISFACTION

[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

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

3.2 Program Resource Requirements

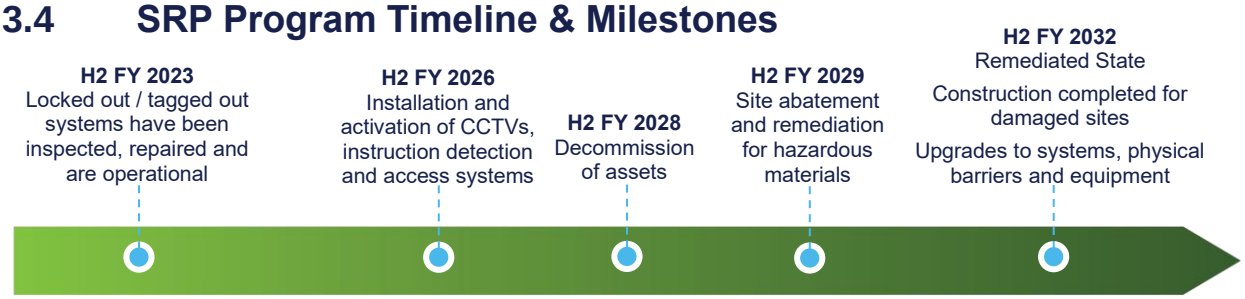
Each project within the program will have its own resource requirements to be identified as part of a project plan. In general, the program will require resources to be hired internally as well as external contractors to complete work required.

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



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

ENABLING PORTFOLIO – SYSTEM REMEDIATION PLAN PROGRAM

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

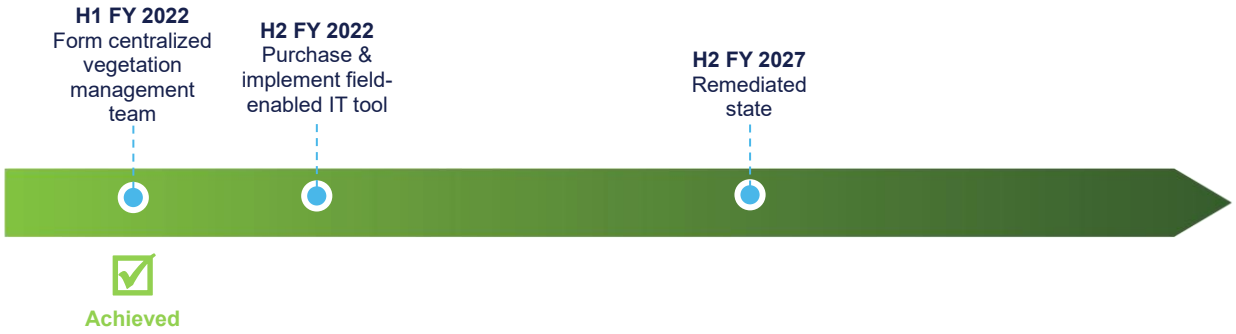
- Recruitment and inclusion of experienced VM SMEs in LUMA's VM team to address any gaps in knowledge and skills to support development of an effective program based on industry standards and best practices
- To the extent dictated by workload and VM related system performance engagement of experienced 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

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.

- 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+).

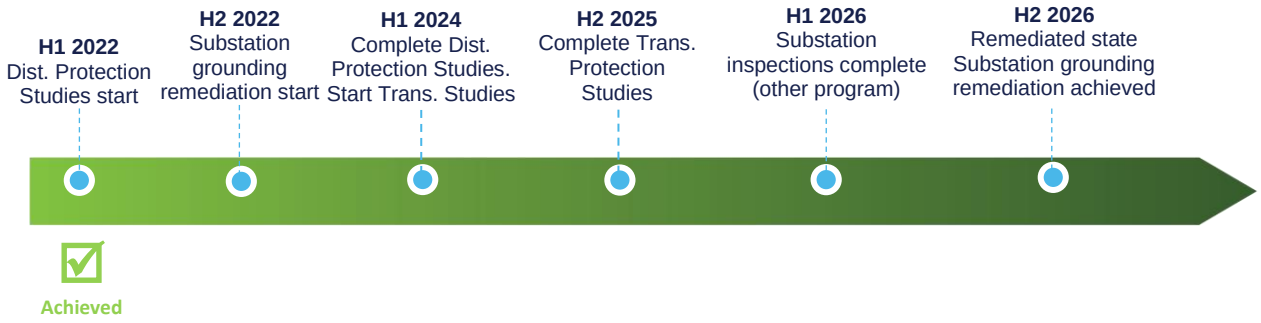
For Other Reliability Indices Project

- 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



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

ENABLING PORTFOLIO – SYSTEM REMEDIATION PLAN PROGRAM

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.**

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

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.

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

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

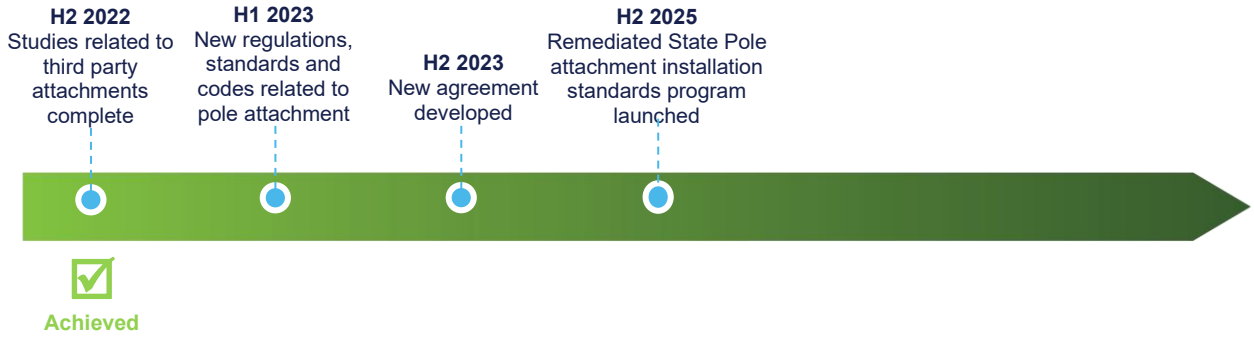
3.3 Estimating Methods & Assumptions

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



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".

- 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.

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.