

**GOVERNMENT OF PUERTO RICO  
PUERTO RICO PUBLIC SERVICE REGULATORY BOARD  
PUERTO RICO ENERGY BUREAU**

**IN RE:**

PLAN PRIORITARIO PARA LA  
ESTABILIZACIÓN DE LA RED  
ELÉCTRICA

**CASE NO. NEPR-MI-2024-0005**

**SUBJECT:** Motion Submitting LUMA's  
Presentation for Virtual Technical Workshop  
Scheduled for September 11, 2024

**NEPR**

**Received:**

**Sep 9, 2024**

**2:15 PM**

**MOTION SUBMITTING LUMA'S PRESENTATION FOR VIRTUAL TECHNICAL  
WORKSHOP SCHEDULED FOR SEPTEMBER 11, 2024**

**TO THE PUERTO RICO ENERGY BUREAU:**

**COME NOW LUMA Energy ServCo, LLC and LUMA Energy, LLC** (collectively "LUMA") through their undersigned legal representatives and respectfully submit and request the following:

**I. Relevant Procedural History and Background**

1. On June 13, 2024, the Puerto Rico Energy Bureau of the Public Service Regulatory Board ("Energy Bureau") issued a Resolution and Order ("June 13<sup>th</sup> Order") initiating this proceeding and ordering LUMA, Genera PR, LLC ("Genera") and the Puerto Rico Electric Power Authority ("PREPA") to each develop and submit to the Energy Bureau an "aggressive preliminary plan of improvements to the electric system" ("Preliminary Plan") with the information specified in the June 13<sup>th</sup> Order and having a maximum implementation period of two (2) years. *See* June 13<sup>th</sup> Order on pages 1-2. The Energy Bureau also indicated that, once submitted, and after the required evaluation, the Energy Bureau would schedule a public hearing for public expression on the plans. *See id.* at page 2.

2. On July 10, 2024, LUMA submitted to the Energy Bureau the Preliminary Plan in the form of a draft ("Preliminary Plan Draft"). *See Motion in Compliance with Order to Show*

*Cause of July 5, 2024 and Submitting Preliminary Plan Draft Required by the Resolution and Order of June 13, 2024* (“July 10<sup>th</sup> Motion”) on pages 3, 8, 9 and 12. LUMA clarified that this plan was being issued in draft form and that LUMA would continue its rigorous review of the Preliminary Plan Draft and would be submitting a more refined version of the Preliminary Plan Draft on or before July 19, 2024. *See id.* at pages 8, 9 and 12.

3. On July 19, 2024, LUMA submitted an updated Preliminary Plan and requested the Energy Bureau to use it as the Preliminary Plan to be subject to evaluation in this proceeding, instead of the Preliminary Plan Draft. *See Motion Submitting Updated Preliminary Plan* on page 5 and Exhibit 1.

4. On August 9, 2024, the Energy Bureau issued a Resolution and Order (“August 9<sup>th</sup> Resolution and Order”) indicating that all parties (LUMA, Genera and PREPA) had submitted their Preliminary Plans and establishing a procedural calendar for the analysis of these Preliminary Plans. *See August 9<sup>th</sup> Resolution and Order* on pages 1-2. As part of this procedural calendar, the Energy Bureau scheduled a Virtual Technical Workshop with LUMA, Genera, PREPA and stakeholders for September 11, 2024, at 10:00 a.m., and, among others, directed LUMA, Genera and PREPA to “present and thoroughly discuss their Preliminary Plan” during the Virtual Technical Workshop. *See id.* at page 2. The procedural calendar established by the Energy Bureau also provides for LUMA, Genera and PREPA to file their presentations for the Virtual Technical Workshop by September 9, 2024, at 2:00 p.m. *See id.*

## **II. Submittal of Presentation for Virtual Technical Workshop**

5. In accordance with the requirements in the August 9<sup>th</sup> Resolution and Order, LUMA submits herein as *Exhibit 1* a copy in PDF format of the presentation that LUMA will use for the Virtual Technical Workshop scheduled for September 11, 2024.

**WHEREFORE**, LUMA respectfully requests that the Energy Bureau **take notice** of the aforementioned and **accept** LUMA's presentation for the Virtual Technical Workshop scheduled for September 11, 2024, in compliance with the August 9<sup>th</sup> Resolution and Order.

**RESPECTFULLY SUBMITTED.**

We hereby certify that we filed this Motion using the electronic filing system of this Energy Bureau and we will send an electronic copy of this Motion to counsel for PREPA Alexis G. Rivera Medina, [arivera@gmlex.net](mailto:arivera@gmlex.net) and [mvalle@gmlex.net](mailto:mvalle@gmlex.net); counsel for Genera PR LLC, [lrn@roman-negron.com](mailto:lrn@roman-negron.com), as well as [regulatory@genera-pr.com](mailto:regulatory@genera-pr.com) and [legal@genera-pr.com](mailto:legal@genera-pr.com).

In San Juan, Puerto Rico, this 9<sup>th</sup> day of September 2024.



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## **Exhibit 1**

LUMA's Presentation for Virtual Technical Workshop Scheduled for September 11, 2024



# System Improvements Plan Virtual Technical Workshop Presentation

September 9, 2024

# Disclaimer

- All information presented in this **Virtual Technical Workshop** is based on present project plans, details and contingent on funding availability. Furthermore, the plans presented here are subject to change as operational performance, equipment failures, and events on the system require re-prioritization. Transmission & Distribution studies, and plans continue to progress.

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# Introduction

- On June 13, 2024, the Puerto Rico Energy Bureau (PREB) issued a Resolution and Order (R&O) opening an administrative proceeding for the development of a Prioritization Plan to accelerate improvements to the electrical system. The PREB ordered LUMA, the Puerto Rico Electric Power Agency (PREPA), and Genera PR to develop an aggressive preliminary plan to improve the electrical system.
- On July 10, LUMA submitted a draft version of the preliminary plan. Subsequently on July 19, a final version of the preliminary plan was submitted to the PREB.
- On August 9, the PREB established a procedural calendar that includes a Technical Workshop on September 11 and a Public Hearing on October 2.
- The focus of today's discussion relates to plan execution, key gaps and challenges, reliability and operational performance, and development of a 2-year system improvement plan.





# Federal Funds to Repair Natural Disasters

- Following Hurricane Maria, the Federal Emergency Management Agency (FEMA), the Central Office for Recovery, Reconstruction and Resiliency (COR3), and PREPA identified damages to the T&D System across Puerto Rico that they estimated required \$9.7 billion in investments to repair:
- FEMA has estimated that \$7.6B additional funds to mitigate hazards should be deployed for Puerto Rico's energy system
- In the midst of repairing damages caused by Hurricane Maria, in September 2022, Puerto Rico was hit by Hurricane Fiona, which produced more than 50,000 points of damage
- The T&D System has suffered further damage in 2024 as a result of excessive rainfall events, which have caused significant landslides in certain areas, as well as Tropical Storm Ernesto, which produced incremental damages to an already vulnerable T&D System.

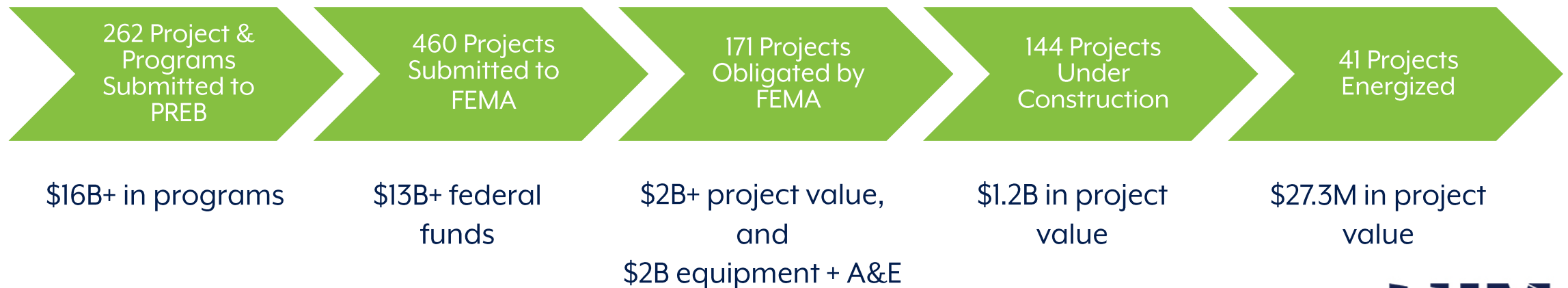
# An update on LUMA's Goals and Progress

- **Strengthening the energy system against storms and hurricanes** by replacing more than 17,000 utility poles
- **Reducing the size and the impact of outages** by installing over 8,200 grid automation devices, which has saved customers over 133 million service interruption minutes
- **Addressing a major cause of outages** by clearing vegetation from over 4,800 miles of powerlines and electric infrastructure
- **Improving community safety and energy efficiency** by replacing over 120,000 streetlights as part of LUMA's Community Streetlight Initiative
- **Empowering the adoption of solar energy** by connecting over 112,000 customers to rooftop solar, representing 735 megawatts of renewable energy for Puerto Rico
- **Improving reliability during generation shortfalls** by launching the Customer Battery Energy Sharing (CBES) initiative

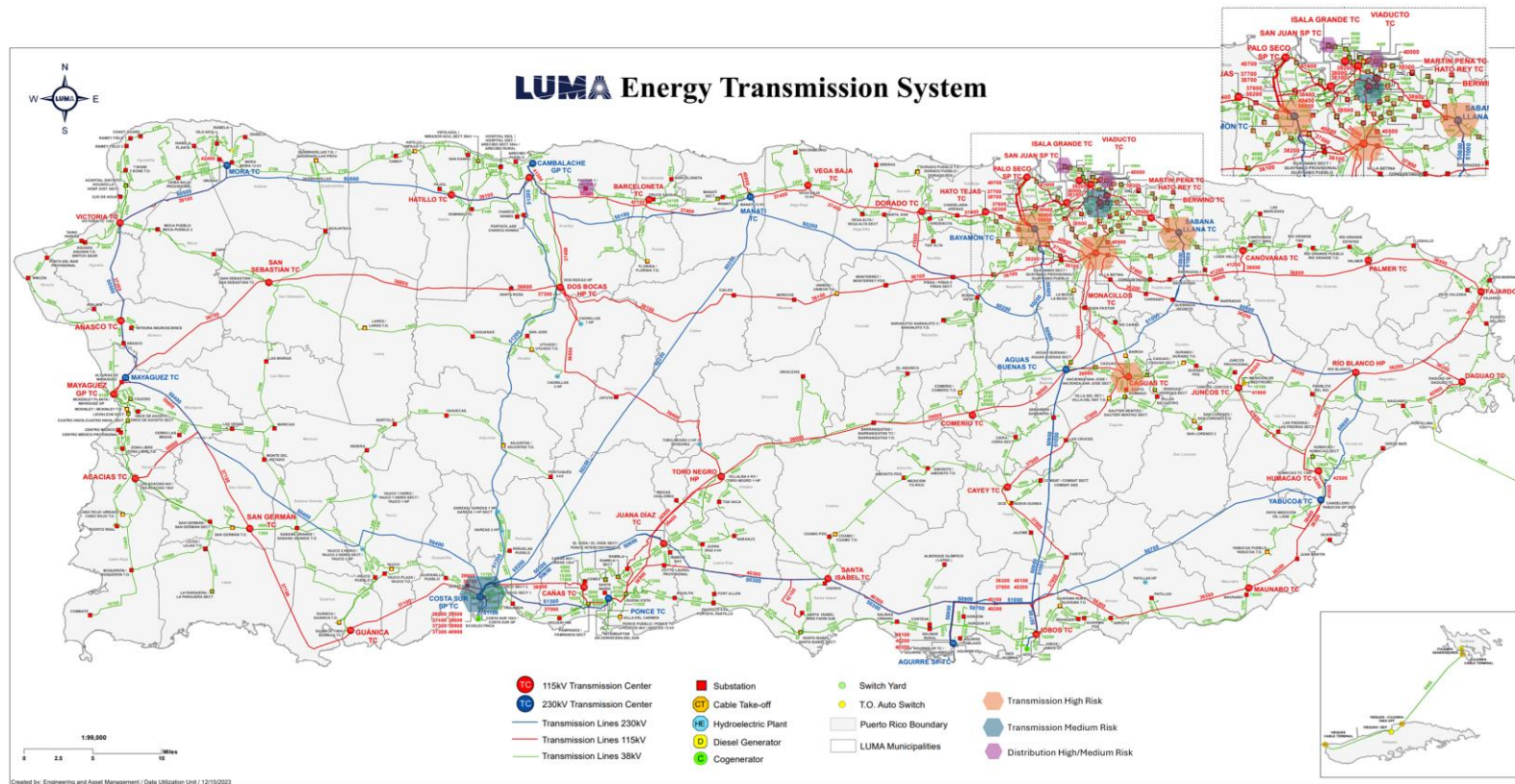


# Federal Funding to Drive Long Term Progress

- Key partnerships necessary to advance projects
  - PREB, COR3, FEMA
  - Close cooperation with all agencies
  - Submitted 262 initial scopes of work (ISOWs) for projects and programs to the PREB
  - Submitted over 460 projects for consideration of federal funding – a record pace for Puerto Rico
- 460 projects represent \$13+ billion in federal funds



# Transmission and Substation Overview



## Substation Data

Substation Sites

299

Large TC Transformers

50

Distribution Transformers

430

## Transmission Data

230 kV

424 miles

115 kV

711 miles

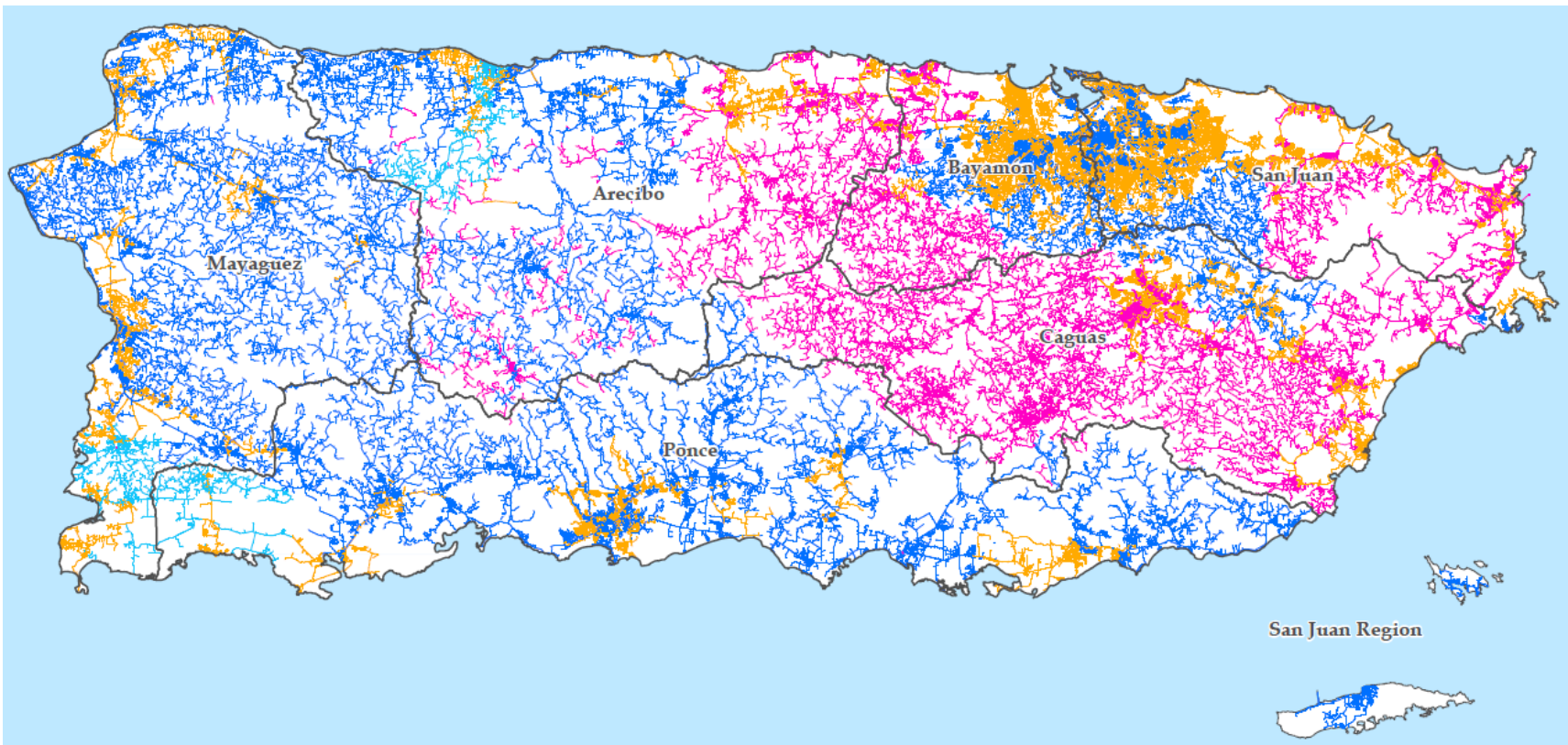
38 kV

1563 miles





# Distribution System Overview



## Feeder Level

- 4 kV
- 7 kV
- 8 kV
- 13 kV
- LUMA Regions

Distribution Voltage	Number of Circuits	% of Total
4.16	613	54
4.8	2	0.2
7.2	18	1.6
8.32	164	15
13.2	331	29



# System Critical Contingency Equipment

# Critical Substation Assets

Location	Asset Needing Replacement	System Risk	System Impact (MW)	Funding Status
Out of Service Transformers in Transmission Centers				
Site 1	544 MVA 230/115 kV	High	270	FEMA
	112 MVA 115/38 kV	High	10	Non-Federally Funded Capital (NFC) – Not Funded
Site 2	504 MVA 230/115 kV	High	270	FEMA
Site 3	544 MVA 230/115 kV	Medium	10	Not Obligated
Site 4	112 MVA 115/38 kV Bank 1	High	180	NFC – Not Funded
	112 MVA 115/38 kV Bank 3	High	180	NFC – Not Funded
Site 5	112 MVA 115/38 kV	High	180	NFC – Not Funded
Site 6	56 MVA 115/38 kV	High	20	NFC



# System Improvements Preliminary Plan



# System Improvements Preliminary Plan

LUMA's Improvement Programs cover critical asset categories and utility processes. Below is a high-level view of the Improvement Programs LUMA is prioritizing for the next two fiscal years that will directly improve system stability and reliability.

- ❑ Immediate focus in the next 2-years includes:
  - ✓ Substation Major Projects
  - ✓ Transmission Major Projects
  - ✓ Transmission Preventive Maintenance



# Substation Major Projects Overview

- The Substation Rebuilds program focuses on improvements to substations to strengthen the electric grid, and covers required high-level assessments, minor substation repairs, rebuilding of damaged or end-of-life substations, and the relocation of substations with a high risk of flooding when flood mitigation alone is not an option. This includes upgrades to the latest codes and industry standards to achieve reliability improvement. Based on analysis conducted by LUMA, 87 substation sites are located within areas determined by FEMA as susceptible to flooding.
- Below are some of the major substation projects aimed to improve the system, these are a subset of the larger scope of work LUMA will be performing over the next several years as described on the latest FEMA 90day Plan

Fiscal Year 25-26 Budgets		
Fiscal Year	FY2025	FY2026
Est. Budget (\$M)	\$89*	\$172*

\*Pending FEMA Obligation

Major Substation Projects Impacting System Improvement	Construction		FEMA Obligation Status
	Estimated Start Date	Estimated Completion Date	
Manatí TC BRKS 230 kV	11/2022	12/2022	Obligated
Aguirre BKRS T018	05/2023	FY2027	Obligated
Costa Sur BKRS P001	05/2024	FY2026	Obligated
Sabana Llana TC	04/2023	FY2029	Obligated
Bayamón TC BRKS 230 kV	FY2025	FY2026	Obligated
San Juan SP TC	FY2025	FY2029	Obligated
Aguirre TC Phase II Rebuild	FY2026	FY2029	Obligated
EPC Monacillos TC – Rebuild	FY2026	FY2029	Obligated



# Transmission Line Major Projects Overview

This program includes numerous 230 kV, 115 kV, and 38 kV projects to harden and upgrade the transmission system. The upgrade process also involves undergrounding targeted lines, with a design for accommodating future circuits for reliability and redundancy (e.g., undergrounding) on select transmission lines. In addition to the overhead transmission line upgrade work, this program includes the 115 kV underground cable repair in the San Juan area.

Fiscal Year 25-26 Budgets		
Fiscal Year	FY2025	FY2026
Est. Budget (\$M)	\$67*	\$163*

\*Pending FEMA Obligation

Projects Name	Construction		FEMA Obligation Status
	Estimated Start Date	Estimated Completion Date	
Line 100/200	7/2024	10/2024	NFC
Preliminary Network Upgrades	FY2025	FY2026	Pending
3600 – Monacillos TC to Martin Pena	FY2026	FY2028	Pending
2800 – Aguadilla Hospital Distrito Sect to T-Bone TO	FY2026	FY2027	Pending



# Transmission Line Preventative Maintenance Activities

- Part of LUMA's system reliability improvement plan is to conduct yearly evaluation of the system condition and reliability performance. The yearly reliability improvement plan for transmission focuses on specific transmission line segments that have experienced multiple failures resulting in customer outages over the previous fiscal year (12-month performance).
- LUMA determined that the top 51 line segments on the 38 and 115 kV systems contributed to approximately 75% of all transmission related customer minute interruptions. To help mitigate future outages and improve overall system reliability, LUMA is inspecting all 51 line segments during FY2025 and performing repairs on all critical components on the 1,000+ structures.





# Vegetation Clearing Program

# Vegetation Clearing Program

- Vegetation is the largest contributor to all outages in Puerto Rico. To help improve reliability and safety, LUMA launched a \$1.2 billion, FEMA-funded Vegetation Safety and Reliability Initiative to clear 16,000 miles of powerlines over the next four years (between FY2025 and FY2028).
- Each region is divided into 5 Groups by Asset Description (A-E).

Group	Asset Description
A	Distribution EHP Non-Sensitive Vegetation
B	Transmission 38 kV EHP Non-Sensitive
C	All 38 kV & Distribution EHP Sensitive
D	Transmission 115 kV
E	Substation & Telecom Sites
F	All Regions Transmission 230 kV

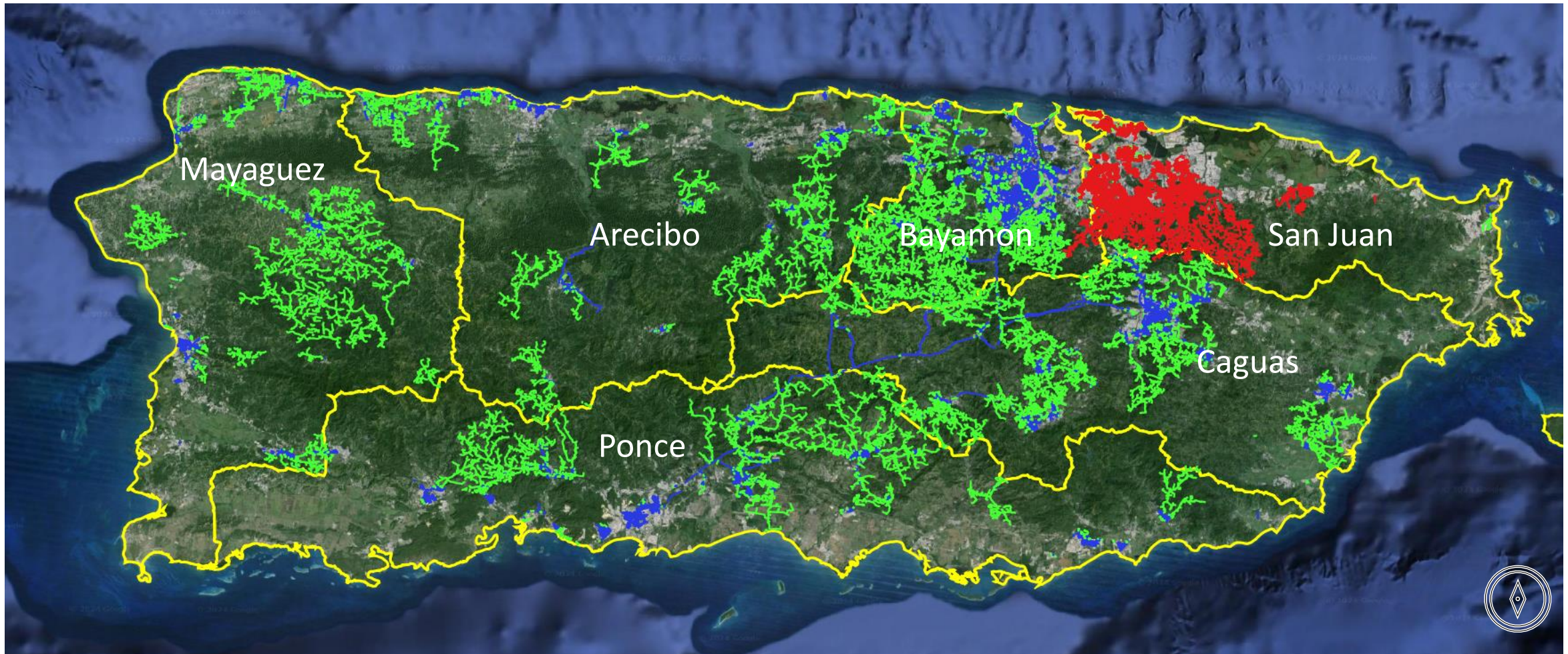
# Updates to Original Project Plan

- Groups A & B were divided into High Density and Low Density, except San Juan Group A, creating 11 new projects. These were divided based on an agreement between LUMA and FEMA and is intended to help our partners at FEMA decrease the timeline required for environmental reviews.
- San Juan Group A was obligated on June 6th, 2024
- High Density refers to urban areas with large concentration of customers and a high percentage of impervious surfaces, and which represent refer environmental concerns and can follow an accelerated obligation process
- Low Density refers to rural areas with a higher chance of environmentally sensitive plant and animal species and which require greater consideration by EHP, and therefore take longer to obligate
- 42 total projects with unique FAASt numbers





# Updates to Original Project Plan- Group A's



- Group A Low Density Feeders —
- Group A High Density Feeders —
- San Juan Group A Feeders —



# Updates to Original Project Plan- Group B's



Group B Low Density Feeders    —  
Group B High Density Feeders    —

# Updates to Original Project Plan – Groups A & B

Project Region/FAAST Number	Final FEMA Submittal	Obligation Date
Group A High Density		
Bayamón - 727572	7/2024	Pending
Arecibo - 728827	7/2024	Pending
Caguas - 727692	7/2024	Pending
Mayagüez - 728832	8/2024	Pending
Ponce - 727531	8/2024	Pending

Project Region/FAAST Number	Final FEMA Submittal	Obligation Date
Group A Low Density		
Bayamón- 750065	8/2024	Pending
Arecibo - 750066	9/2024	Pending
Mayagüez - 750068	10/2024	Pending
Caguas - 750067	9/2024	Pending
Ponce - 750063	10/2024	Pending

Project Region/FAAST Number	Final FEMA Submittal	Obligation Date
Group B High Density		
San Juan - 740406	8/2024	Pending
Bayamón - 740408	8/2024	Pending
Arecibo - 740410	8/2024	Pending
Mayagüez - 740411	9/2024	Pending
Caguas - 740409	9/2024	Pending
Ponce - 740414	10/2024	Pending

Project Region/FAAST Number	Final FEMA Submittal	Obligation Date
Group B Low Density		
San Juan - Pending	10/2024	Pending
Bayamón - Pending	11/2024	Pending
Arecibo - Pending	11/2024	Pending
Mayagüez - Pending	12/2024	Pending
Caguas - Pending	12/2024	Pending
Ponce - Pending	1/2025	Pending



# Updates to Original Project Plan – Groups C - F

Project Region/FAASt Number	Final FEMA Submittal	Obligation Date
Group C		
San Juan - 727691	8/2024	Pending
Bayamón - 727558	8/2024	Pending
Arecibo - 727540	9/2024	Pending
Caguas - 727694	9/2024	Pending
Mayagüez - 727562	10/2024	Pending
Ponce - 727530	10/2024	Pending

Project Region/FAASt Number	Final FEMA Submittal	Obligation Date
Group D		
San Juan - 727608	8/2024	Pending
Bayamón - 727522	8/2024	Pending
Arecibo - 727659	9/2024	Pending
Mayagüez - 727657	10/2024	Pending
Caguas - 727606	9/2024	Pending
Ponce - 727529	10/2024	Pending

Project Region/FAASt Number	Final FEMA Submittal	Obligation Date
Group E		
San Juan - 741097	11/2024	Pending
Bayamón - 741098	11/2024	Pending
Arecibo - 741101	11/2024	Pending
Mayagüez - 741102	11/2024	Pending
Caguas - 741100	11/2024	Pending
Ponce - 741104	11/2024	Pending

Project Region/FAASt Number	Final FEMA Submittal	Obligation Date
Group F		
San Juan - 741105	11/2024	Pending
Bayamón - 741105	11/2024	Pending
Arecibo - 741105	11/2024	Pending
Mayagüez - 741105	11/2024	Pending
Caguas - 741105	11/2024	Pending
Ponce - 741105	11/2024	Pending







# Vegetation Management Ops

# Vegetation Management (VM) Overview

- VM scope of work is different than the Vegetation Clearing program
  - VM will be doing maintenance trimming where the Vegetation Clearing program will be focused on a one-time reclamation/remediation of the Right-of-Ways and Easements
  - VM maintenance work is currently centered on trimming vegetation which is contacting or may have contact with electric lines within 1 year. We consider this Vegetation Hotspot work or Priority Trimming
- Distribution Circuits, 38 kV and 115 kV yearly plan provided by LUMA's Reliability Team
  - Uses historical data to determine which circuits have had greatest impact on reliability metrics (focus on reducing contribution to SAIDI and SAIFI)
  - Circuits the Vegetation Clearing Program are currently working, or will work, this Fiscal Year (FY) will not be performed as part of the VM current FY plan
  - Within the next 2 years VM will be targeting approximately 1,000 circuit miles per Fiscal Year (including a mix of Distribution and Transmission lines)



# Progress from June 2021 to June 2024

- All substations have had vegetation inside of fences remediated
  - Vegetation control is now on a cycle; each substation will have a treatment every 5 – 6 months. Currently finishing up 6th round of treatments
  - Zero outages due to vegetation in FY2023 and FY2024
- All 230 kV circuits completed by end of FY2024
  - Last circuit completed April 2024
  - Cycle maintenance has begun, starting with circuits first completed in FY2022
- 161 circuit miles of 115 kV lines have been completed
- 456 circuit miles\* of 38 kV lines have been completed

*\*Note these miles do not include corrective miles.*



# Vegetation Management – Distribution

- Focus on circuits not on current year Vegetation Clearing Project
- Scope of work is maintenance and vegetation hotspot trimming, not full reclamation
- 600 – 650 – Distribution line miles estimated per fiscal year
- 4 vendors dedicated to Distribution VM
- 260-270 FTEs / 90 – 95 Crews



# Vegetation Management - Transmission

- Focus on 38 kV and 115 kV
  - Scope of work is vegetation hotspot trimming
- 38 kV and 115 kV plan provided by Reliability team
- 230 kV on cycle trim schedule
- Targeting 350 - 400 miles per fiscal year
- 3 Vendors dedicated to Transmission VM
  - 125 -130 FTEs / 30 - 33 crews
- Quarterly aerial patrols







# System Improvement Benefits

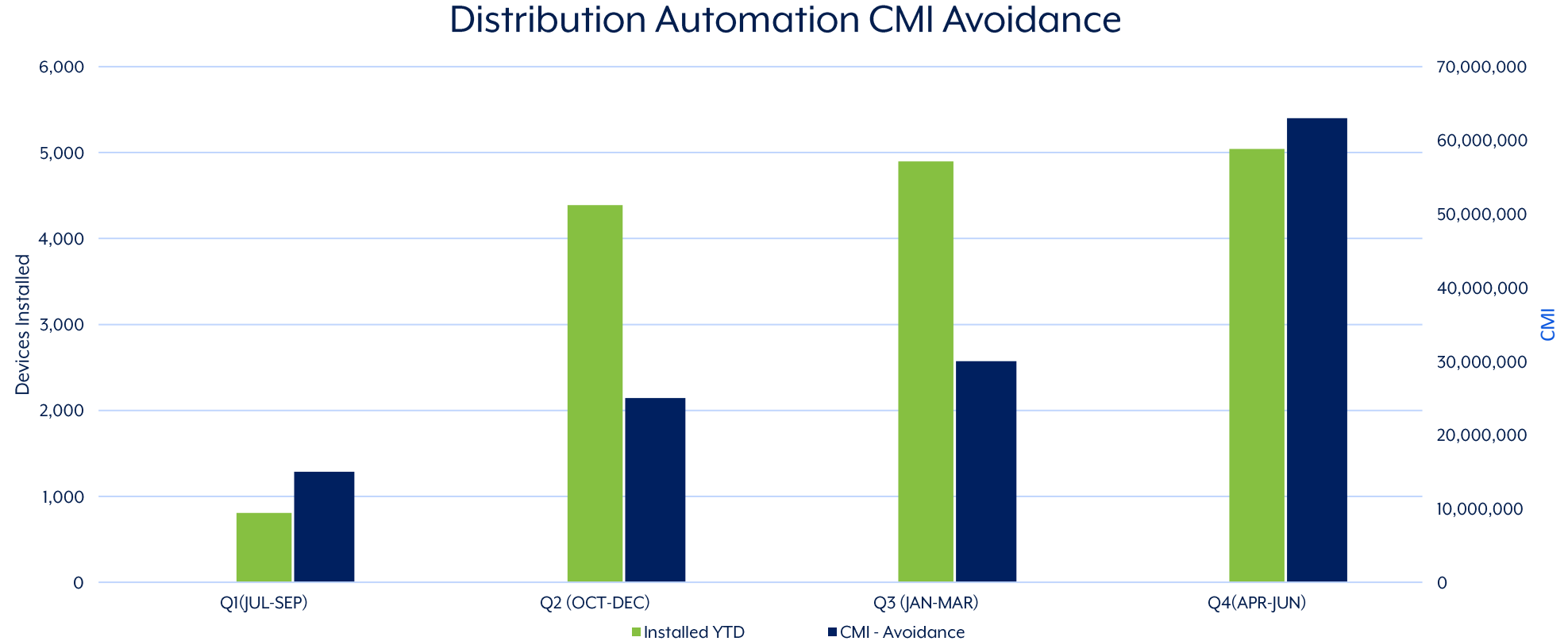
# System Improvements Plan Benefits

LUMA is currently implementing a series of initiatives aimed at modernizing the system to meet industry standards by assessing and upgrading our infrastructure to enhance grid resiliency, improve system reliability and prioritizing proactive measures such as assessing, repairing, and replacing critical substation, transmission, and distribution assets.

- Present Challenges:
  - Substation transformers and transmission lines currently out of service due to equipment failures. The reinstatement of these assets is imperative to mitigate the likelihood and impact of widespread outages.
- Look ahead – FY2026:
  - The system improvement plan aims to reinstate critical equipment assets to reduce the likelihood of large-scale outages.
  - The System Remediation Plan (SRP) implementation which include extensive efforts such as continuous vegetation clearing, critical equipment restoration, and the deployment of automated grid technology.
  - Deployment of automated grid technologies such as automated switchgear and fault sensors across transmission and distribution system.



# Distribution Automation Benefits



Our Distribution Automation program avoided more than 133 million minutes of customer interruptions in FY2024. This year, through end of Q4 LUMA has installed more than 5,000 devices across Puerto Rico to improve system reliability.





# Advanced Metering Infrastructure

# Advanced Metering Infrastructure (AMI) is a core element of an Advanced Grid Infrastructure (AGI)

- FEMA has obligated \$877M for the purchase of AMI meters, network equipment and installation across Puerto Rico
- LUMA is currently in the final stages of contract negotiations with vendors for the Meter Technology and equipment, Systems Integrations into existing and new LUMA systems and a Project Management Office to assist in change management and process design within LUMA and for its customers.
- AMI will provide detailed real time system information including outages, restorations, voltage information and theft detection as some of the main benefits.
- Smart Meters are the building block of an Advanced Grid Infrastructure.



# AGI-Enabled Customer Benefits

**Better customer experience:** With AGI, utilities can better engage with customers not only by providing information about usage, but projecting monthly bills, alerting customers to unusual usage patterns, and sending proactive messages about outages and restoration times. All of this is translating into more convenience, less frustration, increased reliability, lower costs, and a better customer experience.

## Customer Safety

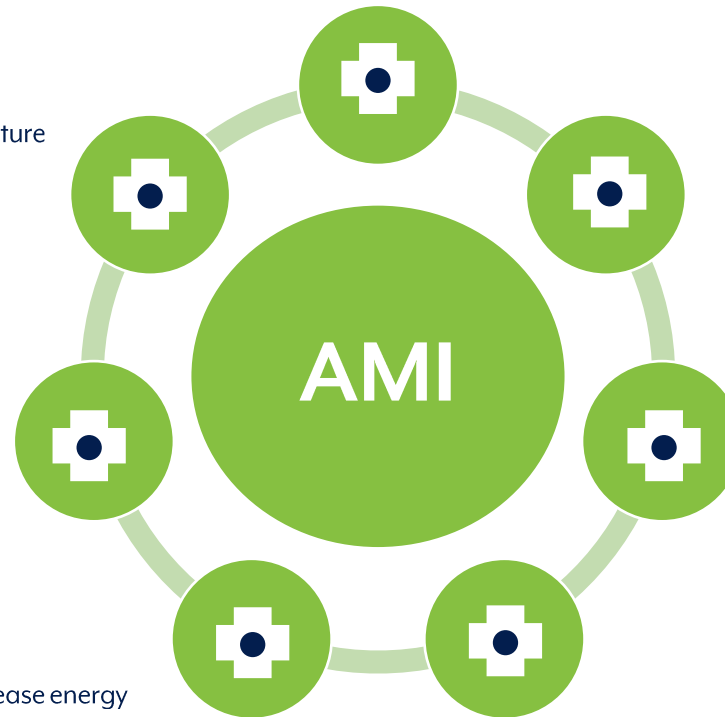
- Identifying unregistered solar installations/code violations.
- Identifying downed live conductors.
- Identifying heated customer panels/sockets using temperature data to help with fire prevention.
- Determine fire-caused outages using temperature data.

## Increased Convenience

- Remote connection of service allows immediate service connections (and disconnections) without sending a field technician to the customer site.
- More self-service capabilities such as the ability to “ping” a meter during an outage restoration, view a projected bill, pay a bill, and start or stop service online.
- Information specific to the customer can be delivered proactively and made available to the call center for better call resolution.

## Reduced Fees and Costs

- More rate options that align with customer behavior to decrease energy usage and lower costs.
- Easier access to demand response programs and products that help customers to save money.



## Fewer unplanned outages / increased reliability

- Proactive maintenance allows utilities to better assess asset health and plan equipment replacements.
- Planned replacements are quicker (so the outage is shorter) and cost less.

## Faster restoration times and improved services

- Utilities can more accurately determine the location of outages and dispatch crews more efficiently.
- More complete restorations. Crews can verify that the restoration is complete before moving to another area including detecting “pocketed” outages.
- Outage updates and proactive outage notifications keep the customer informed.

## More Information and Control

- Web portals and apps can provide information to empower customers to understand their usage patterns and find opportunities to lower their energy costs.
- High bill alerts help customers track their energy usage and costs.
- Additional data for high bill research that helps customers tie behavior to costs and make changes that can lower their bill.
- With more information for customer service reps, utilities report high customer satisfaction and better call resolution.
- Fewer estimated reads increases customer confidence and trust.

## Improved Power Quality

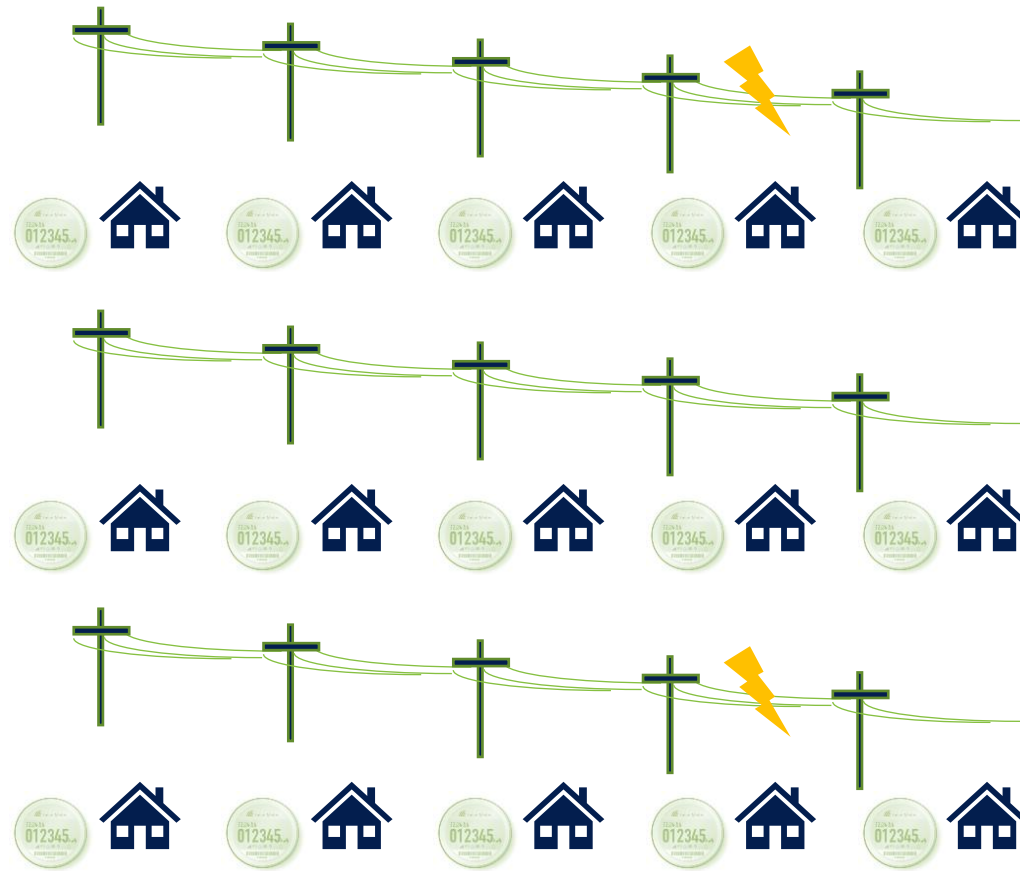
- Visibility into how the system is operating allows utilities to better detect voltage fluctuations that can create power quality issues.

Source: Voices of Experience, Leveraging AMI Networks and Data, U.S. DOE



# Outage Management

- Smart meters can provide notifications to an **Outage Management System (OMS)** when power is lost.
- **OMS can locate the faulted section** of the distribution feeder and deploy a repair crew before the customer calls in an outage.
- Once the repairs are made, **OMS will receive restoration notifications** from the smart meters.
- If there are pocket outages, OMS will let field crews know that power was not restored to some customers and additional repairs are needed.



**Customer Benefit:** Reduces outage times by improving restoration times and reduces customer calls about outages.



# AMI Program Operational Benefits

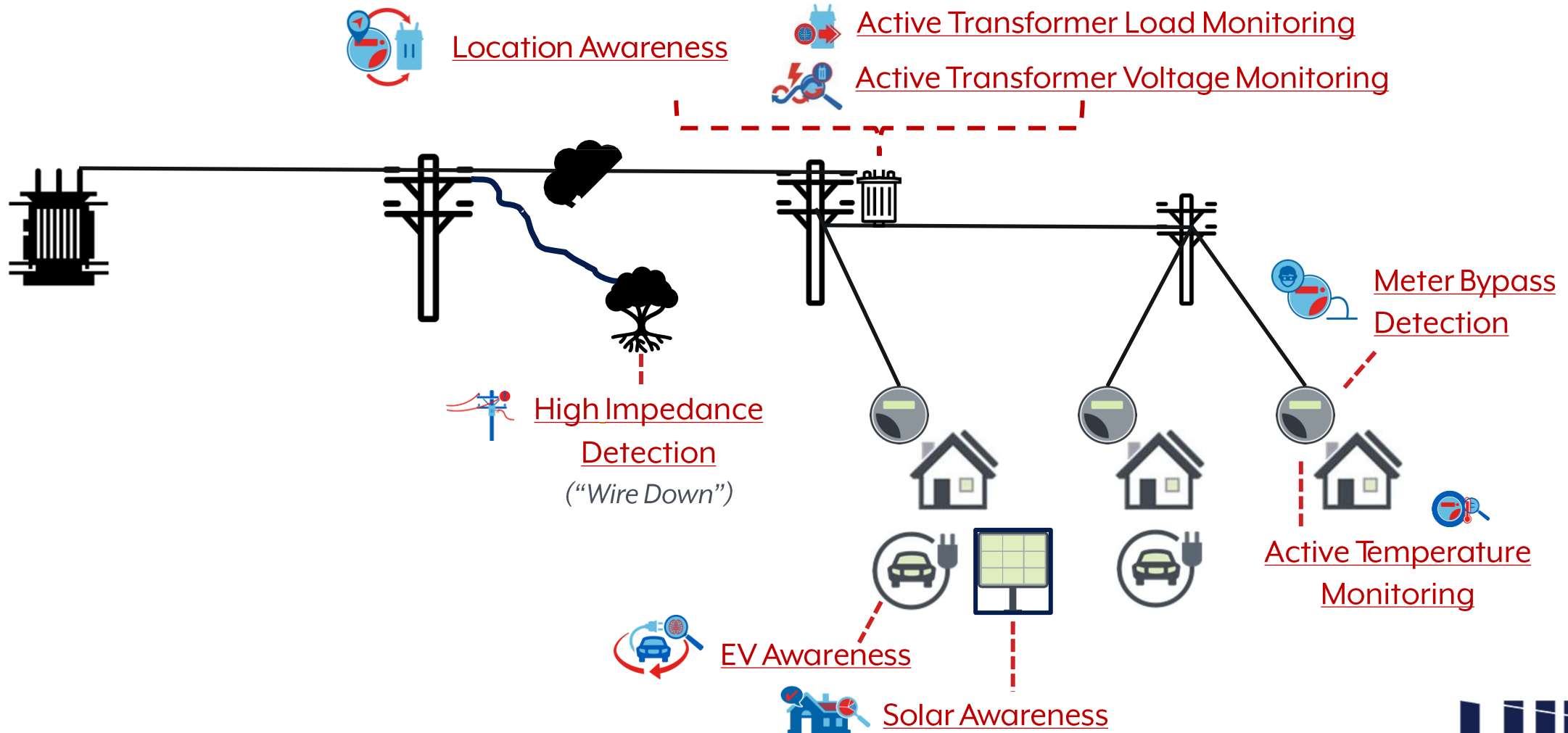
Reduction in Meter Maintenance	<ul style="list-style-type: none"><li>Field orders will be dramatically reduced with meter connectivity and the internal switch capabilities.</li></ul>
Existing Meter Technology Avoided Costs	<ul style="list-style-type: none"><li>By replacing all meters to AMI, software licensing and resources expended to maintain these systems will no longer be needed.</li></ul>
Reduction in Energy Diversion	<ul style="list-style-type: none"><li>AMI yields multiple benefits with regards to theft of service; by touching every meter, existing diversion is identified and remedied while ongoing theft is detected and addressed increasing revenue and reducing losses as well as fewer field orders.</li></ul>
Improved Call Center Operations	<ul style="list-style-type: none"><li>Call disposition will pivot from high bill and estimated bill concerns to informed usage allowing for briefer and more effective interactions with customers; this may result in lower handle times and average speed to answer.</li></ul>
Improved Outage Management	<ul style="list-style-type: none"><li>With AMI intel, outages can be more effectively managed by routing resources with greater specificity and ensuring pocket outages are addressed before resources leave an area avoiding unnecessary return trips.</li></ul>
Improved Collections	<ul style="list-style-type: none"><li>AMI's remote switch allows LUMA to more effectively manage in-arears accounts with no field trips.</li></ul>
Improved Billing	<ul style="list-style-type: none"><li>With fewer estimated bills and more accurate information, Billing is more accurate and requires less human interaction.</li></ul>
Consumption at Inactive Premises	<ul style="list-style-type: none"><li>Use of the remote switch for move in/out, will reduce field orders and increase revenue.</li></ul>





# AMI 2.0 - Distributed Intelligence

## Monitoring & Managing the Distribution Grid



## Next Steps

- Pre deployment walk downs of all meters at customer's premises are being executed. This effort began in April of 2024 with the purpose of performing visual inspections of meters and the meter fittings. The tracing of the meter to transformer assists on verifying and correct existing data which helps for seeing and restoring power after an event.
  - Approximately 90,000 inspections have been completed.
  - Pre deployment walk downs are expected to take two years to complete and will run concurrent with meter exchanges once they begin.
- Network deployment will begin before meter exchanges and stay 2-3 months ahead of meter deployment. LUMA will be installing approximately 4,000 network devices which the meters will communicate to and send information to over a secure network. Network devices will be installed on poles, streetlights and in LUMA substations. This will be a redundant network providing meters with at least 2 paths to send information back to LUMA.



## Next Steps

- Meter exchanges are anticipated to start this year (FY2024) and will ramp up over 12 months.
- It is anticipated to take approximately 3 years to exchange all 1.5 million meters in Puerto Rico including residential and commercial meters.
- At the height of exchanges, LUMA plans to install approximately 60,000 meters a month and ramp down as the work is finished.
- LUMA will be using a contractor and internal workforce to complete these exchanges.



## Planned Deployment Schedule

Region	Start	Finish	Total Meters
San Juan	Q4 FY2024	Q4 FY2025	369,800
Caguas	Q4 FY2025	Q1 FY2026	251,300
Ponce	Q1 FY2026	Q2 FY2026	238,000
Mayagüez	Q2 FY2026	Q4 FY2026	221,500
Arecibo	Q4 FY2026	Q1 FY2027	199,100
Bayamón	Q1 FY2027	Q3 FY2027	230,200

❖ Planned scheduled is dependent on Contract approval and execution to meet these dates.



# Accelerated Storage Addition Program

# ASAP Overview

LUMA has identified an opportunity to add Battery Energy Storage Systems (BESS) at existing Independent Power Provider (IPP) locations on an accelerated basis through a newly developed program called the **Accelerated Storage Addition Program (ASAP)**, the benefits of which include:

- Timeline to bring BESS online can be shortened significantly
- Development risk and regulatory uncertainty can be reduced/minimized
- BESS can improve system reliability and reduce load shed
- ASAP can lower costs significantly

ASAP may add up to 360 MW<sup>1</sup> of BESS capacity at the 12 existing IPP facilities through a **“Standard Offer” amendment to their existing Power Purchase and Operating Agreement (PPOA)**<sup>2</sup>, resulting in improved reliability and reduced load shed for the system at an accelerated pace and reduced cost. There has been strong interest in the program from IPPs.

<sup>1</sup> 360 MW is a preliminary estimate based on interested IPPs, this number can change as program develops.

<sup>2</sup> Any IPP with an existing Point of Interconnection will be eligible to participate in this opportunity.





# ASAP Overview (Continued)

ASAP will be implemented in 2 phases:

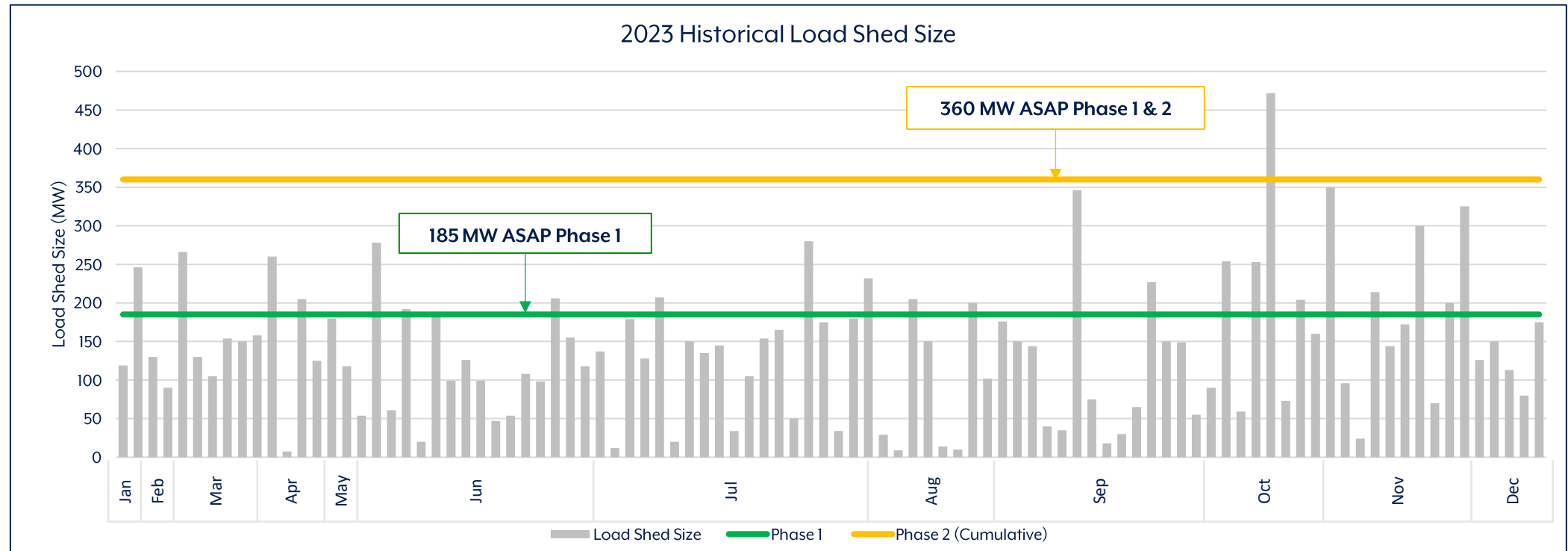
- Phase 1 (~185 MW)<sup>1</sup> may begin immediately, does not require network upgrades or interconnection costs, with some IPP facilities claiming they could be commercial in less than 12 months.
- Phase 2 (~175 MW)<sup>1</sup> may begin after Phase 1 with minor interconnection work.

The “Standard Offer” will be made available to all existing generators with operating Points of Interconnection (POIs) and PPOAs once it has been approved by the PREB. A Standard Offer is defined as a value proposition available to all existing renewable IPPs enabling a non-discriminatory pricing and service offer. This may encourage a higher number of total MW of BESS eventually added to the system through ASAP.

<sup>1</sup> The size of each Phase is a preliminary estimate based on interested IPPs, this number can change as project develops.

# Approximately 3/4 of load shed events in 2023 were below 185 MW in size, the estimated capacity of ASAP Phase 1

- The average size of the load shed events in 2023 was less than 160 MW, below the estimated capacity of ASAP Phase 1.
- Only one load shed was above 360 MW, which is the total estimated size of ASAP Phase 1 and 2.



Illustrated Load Sheds include under-frequency load sheds and manual load sheds.

# Existing IPPs with PPOA's eligible to participate in ASAP



## Solar PV Facilities (7)

1. Oriana Energy
2. Humacao Solar Project
3. San Fermin Solar Farm
4. AES Ilumina
5. Horizon Energy
6. Coto Laurel Solar Farm
7. Cantera Martino

## Wind Turbine Facilities (2)

8. Pattern Santa Isabel
9. Punta Lima Wind Farm

## Landfill Gas Facilities (2)

10. Landfill Gas Tech Toa Baja
11. Landfill Gas Tech Fajardo

## Thermal Facilities (2)

12. EcoEléctrica
13. AES

# ASAP Benefits

- Accelerated timeline to bring BESS online (relative to other BESS projects) and meet PR's battery storage needs
- Enhancing service reliability, resiliency and mitigating the risk of generation-related outages
- Facilitates renewable integration and reduces curtailment
- Contributes to PR's renewable targets, absorbing excess DG
- Ability to charge batteries from the grid in advance of an expected storm and provide energy dispatch and black-start capability after the emergency event
- Flexible contract obligations contribute to provide greater operational/commercial flexibility, which will allow LUMA to learn the true value of different use cases
- Lowers the rate payer's out-of-pocket cost
- Lowers cost to procure storage (through standard offer approach)
- Accelerates BESS deployment due to shorter timeframe to execute contracts and utilization of existing land and POIs
- Reduces generator operational risk by pre-approving augmented capacity if life of battery is affected by operational dispatch decisions



# Thank You!

