

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

**NEPR**

**Received:**

**Jan 27, 2022**

**10:00 PM**

**IN RE: DESPLIEGUE DE  
INFRAESTRUCTURA DE CARGADORES  
PARA VEHICULOS ELECTRICOS**

**CASE NO. NEPR-MI-2021-0013**

**SUBJECT: Motion to Submit Presentation Given by  
LUMA During Technical Workshop held on January 27,  
2022**

**MOTION TO SUBMIT PRESENTATION GIVEN BY LUMA DURING TECHNICAL  
WORKSHOP HELD ON JANUARY 27, 2022**

**TO THE HONORABLE PUERTO RICO ENERGY BUREAU:**

**COMES** now **LUMA Energy ServCo, LLC** (“LUMA”), through the undersigned legal counsel, and respectfully state and request the following:

1. On this date (January 27, 2022), this honorable Puerto Rico Energy Bureau (“Energy Bureau”) held the Second Technical Workshop in the referenced proceeding.
2. During this Second Technical Workshop, LUMA, among others, provided a Presentation, copy of which LUMA herein submits to this Energy Bureau as Exhibit 1.

**WHEREFORE**, LUMA respectfully requests that the Energy Bureau **take notice** of the aforementioned and **accept Exhibit 1** to this Motion.

**RESPECTFULLY SUBMITTED**

In San Juan, Puerto Rico, this 27<sup>th</sup> day of January 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 courtesy copy of this motion to the attorneys for PREPA, Joannely Marrero-Cruz, [jmarrero@diazvaz.law](mailto:jmarrero@diazvaz.law) and Katuska Bolaños-Lugo,

kbolanos@diazvaz.law. LUMA understands that other participants or stakeholders in this proceeding will be notified as a result of the publicity of the filings in this process. Notwithstanding, LUMA will send a courtesy copy of the filing to the following stakeholders: energypr@gmail.com, edwin.ac evedo@ddec.or.gov, idiaz@glenninternational.com, azayas@azeng.net, gerardocosme@solartekpr.net, luisgmoreno@gmail.com, fberriosperitoselectricistas.org, juan.diaz.galarza@guidehouse.com, angel.d.rodriguez@outlook.com, javruasesapr.org, aldo@skootel.com, pablo.rivera@hitachi powergrids.com, divine.energy@hotmail.com, franciscojrullan@yahoo.com, ochavez@padigm.com, antoniovelocicharge.com, dcordero@group-em.com, kenan.d.davila@sargentlundy.com, emelyies.torres@toyota.com, gerard.berlinski@toyota.com, marilyn.maldonado@toyota.com, picleanenergy@gmail.com, bigwheelcorp@gmail.com, ian.rodriguez@toyota.com, Eduardo.pinera@toyota.com, marangelly.cruz@toyota.com, ismael.diaz@warren-ecm.com, alberto.cortes@warren-ecm.com, wnavasesg@gmail.com, rvea@guidehouse.com, rry@tcm.law, agalloza@aggpr.com, victor.martinez@totalenergies.pr, nmontes@ccmpr.com, zlopez@efonalledas.com, omundo@plazalasamericas.com, ialsina@plazalasamericas.com, mlandron@plazaad.com, ruben.gonzalez@pumaenergvy.com, dacosta@aggpr.com, rdiaz@glenninternational.com, l.marcano@aconer.org, jtosado@jmotorambar.net, hamely@motorambar.net, jsantana@motorambar.com, jorrodriiguez@motorambar.net, nannette.berrios@solpetroleum.com, jameauxl@aim.com, j.pibernus@motorambar.com, wilfredsonllc@gmail.com, melvin.ayala@lumapr.com, francisco.berrios@hotmail.com, CR.Tejera@ddec.pr.gov, nrodriguez@senado.pr.gov, nsantos@glenninternational.com, patlopez00@gmail.com, laura.rozas@dlapiper.com, jcardona@aggpr.com, kkoch@tesla.com, jvazquez905@gmail.com, jose.maeso@crowley.com, jortiz@caguasexpressway.com, odette@grupofernandezpr.com, info@carlosmatta.com, jbouza@caguasexpressway.com, erica.cosme@gsonnell.com, clrivera@caguasexpressway.com, flota@caguasexpressway.com, lsundeen@tesla.com, [carlos@cedenogmail.com](mailto:carlos@cedenogmail.com).



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/s/ Laura T. Rozas

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*Exhibit 1*



# Electric Vehicles Charging Infrastructure - Technical Workshop 2

NEPR-MI-2021-0013  
January 27, 2022

# Agenda

- Introduction
- Understanding Electric Vehicles and the Electric Grid
- Recovery and Transformation Framework
- EV Load Management Programs
- Conclusion

# Defining Principles

- LUMA supports clean energy and the transition to EVs, both part of the Sustainable Energy Transformation of Puerto Rico and one of LUMA's strategic goals
- LUMA's efforts already showing results in increased Distributed Generation adoption
- EVs are an important part of decarbonization and, in conjunction with growth of renewable energy, will help to reduce dependence on oil
- LUMA is working to recover and prepare the grid in ways that will support increased adoption of EVs
- LUMA will work with the Bureau and stakeholders in the Phase I planning process to identify, plan and implement actions to support EV adoption.

# RECENT PROGRESS

In the first six months of operation, LUMA made significant progress across multiple areas and energy priorities of importance to its 1.5 million customers, including:

Data as of  
January  
2022

## RELIABILITY & RESILIENCY

**1,800** power poles replaced

**Dozens** of critical distribution breakers upgraded

**100** substations cleared of hazardous vegetation

**3** substations restored

**1M** Pounds of trash, waste and debris cleared and disposed of

## CUSTOMER EXPERIENCE

**25** customer service centers reopened

**4** new customer contact centers opened

**1** minute answer time (reduced from 26 minutes 3 seconds)

**17%** more customer calls answered \*

**<10**-minute wait at Customer Service Centers

**80**-point improvement in J.D. Power Customer Satisfaction (CSAT)

**590,985** fielded calls (39% increase from PREPA)

\*Compared to prior reporting periods

## FEMA/CAPITAL PROJECTS

**10** programs approved by PREB; projects to be defined and submitted to FEMA (~**\$3.1B**)

**4** projects submitted to FEMA; working through EHP/406HM details (~**\$0.03B**)

**97** projects to be assigned to A&E firm (~**\$3.3B**)

**63** projects assigned and preliminary engineering started (~**\$1.0B**)

**\$14.5B** in energy resilience funding available

## RENEWABLE ENERGY

**15,000+** customers connected to renewable energy, totaling 70 MW

**~2,100** DG services activated per month from July –Nov. 2021

**1,000 MW** of new utility-scale renewable energy being integrated

**175 MW** from three other utility scale wind and solar energy facilities

## PEOPLE FIRST, SAFETY ALWAYS

**3,000+** LUMA employees

\*During Sep-Nov. 2021 from previous three months

OSHA recordable injury rate\*

Decreased by **23%**

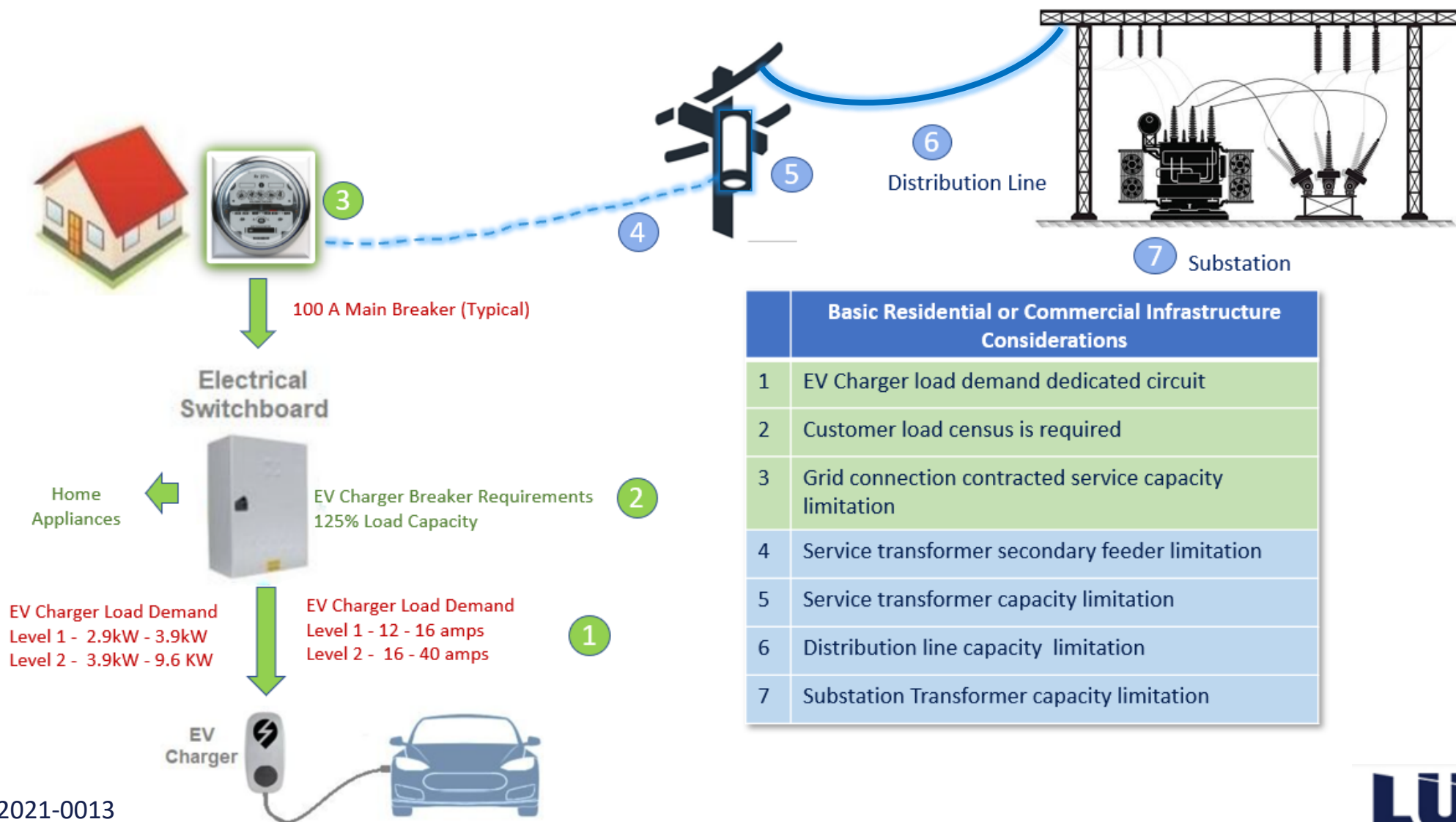
OSHA severity injury rate\*

Decreased by **30%**

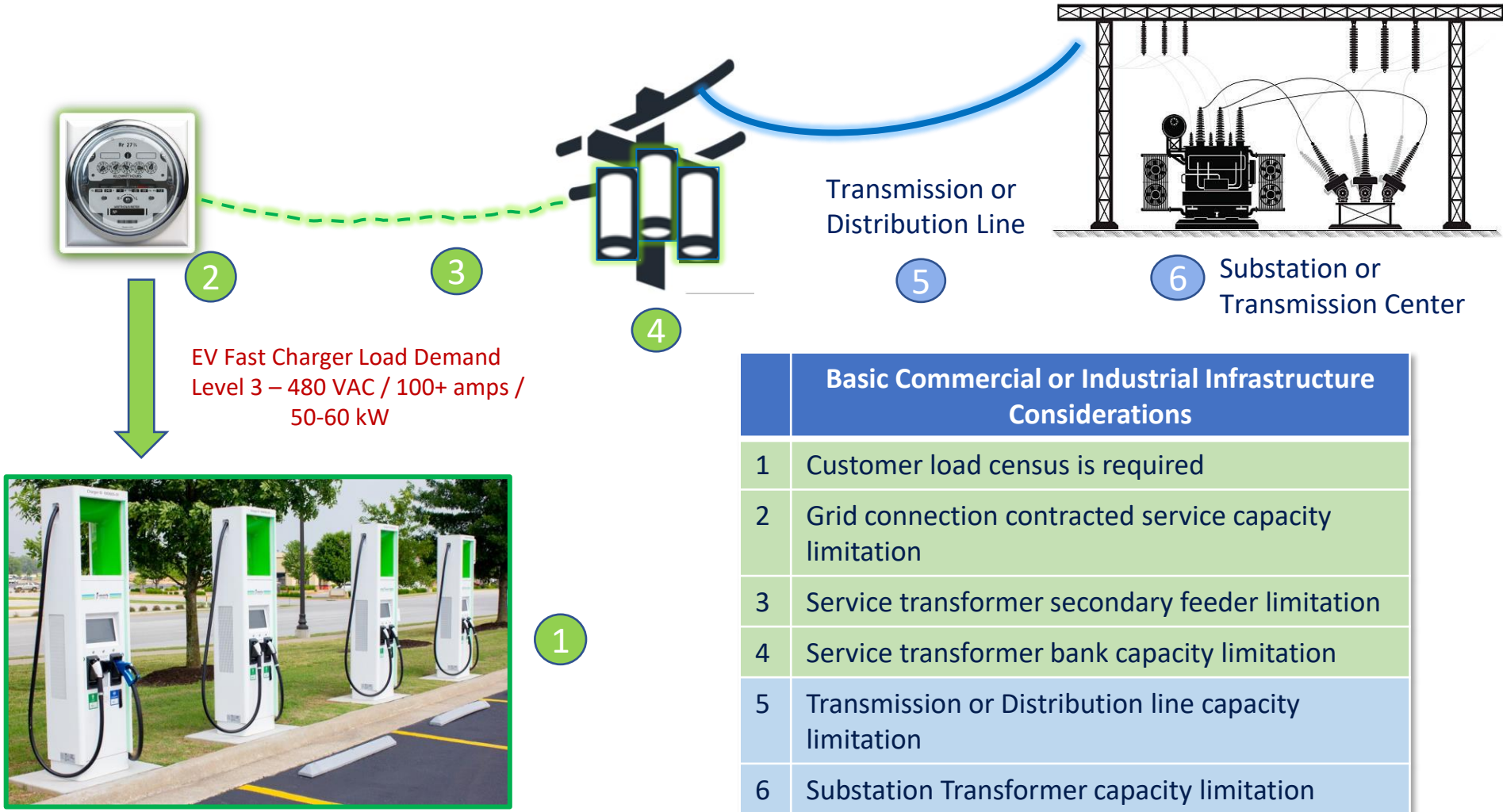
# Understanding Evs and the Electric Grid



# Basic Infrastructure Considerations for Residential or Small Commercial EV Chargers Installation



# Basic Infrastructure Considerations for Commercial or Industrial Fast EV Chargers Installation



	Basic Commercial or Industrial Infrastructure Considerations
1	Customer load census is required
2	Grid connection contracted service capacity limitation
3	Service transformer secondary feeder limitation
4	Service transformer bank capacity limitation
5	Transmission or Distribution line capacity limitation
6	Substation Transformer capacity limitation

# T&D Grid and EVs

## System-Wide Impacts

- Current levels of EV penetration not expected to bring widespread T&D grid challenges in the near future.
- No system-wide study has been conducted in the past; therefore, no data is currently available on the aggregate capacity of the distribution system to serve residential EV loads.
- For LUMA to determine the total level of EV charging that the entire system can accommodate in the near term (as requested), an extensive study would be required.
- EV adoption forecasting is required considering the potential grid constraints and projected operating costs and benefit of EVs.
- The PR100 Study will undertake this system-wide modeling and LUMA will collaborate with this effort to avoid duplication.

## Localized Impacts

- Localized grid-challenges will need to be mitigated/managed in the near-term on a case-by-case basis.
- LUMA will prepare a plan for analyzing and mapping localized, feeder-level “EV hosting capacity” to identify constrained areas.
- We will also work with the Bureau and stakeholders to find ways to manage grid impacts while simultaneously enabling and supporting EV charging infrastructure deployment.

# EV Charging Station Technical Requirements



**Interconnection Requirements will need to be Developed and Adopted**



**Target Locations**

Feeder mains close to Substations with Transformers that have Available Capacity



**Enabling Technology**

Managed Charging – such as adjustable charging levels based on overall station demand

Addition of battery storage to handle peak charging periods

# Improvements on the Electric Grid

As part of the T&D System rebuilding efforts, LUMA performed feeder analysis on the poorest performing feeders and identified voltage and capacity issues.

- Some feeders analyzed are in good condition from a planning study perspective, some have poor voltage regulation which will be exacerbated by the addition of distributed energy resources (DERs), including EV charging.
- Other areas have experienced poor reliability and some feeders and substation transformers have limited capacity, which unless upgraded, will limit EV adoption.
- Feeder mitigation work includes the following:
  - Voltage conversion work from 4kV to 13kV operation
  - Transformer capacity increase
  - Reconductoring
  - Installation of reclosers, voltage regulator and capacitor banks.
- While the main objective of these mitigation plans are for rebuilding the grid to provide a safe and reliable electricity to our customers, it also enables increased DERs and EV penetration.

# LUMA grid improvement programs enable sustainable energy transformation

- Implementation of Advanced Metering Infrastructure (AMI).
- Rebuilding program, bringing distribution circuits up to current standards.
- Distribution automation and introduction of distribution technology including hosting capacity analysis.
- Critical energy management systems, including modern EMS for bulk power system and Advanced Distribution Management System.

# Recovery & Transformation Framework

# Recovery & Transformation Framework

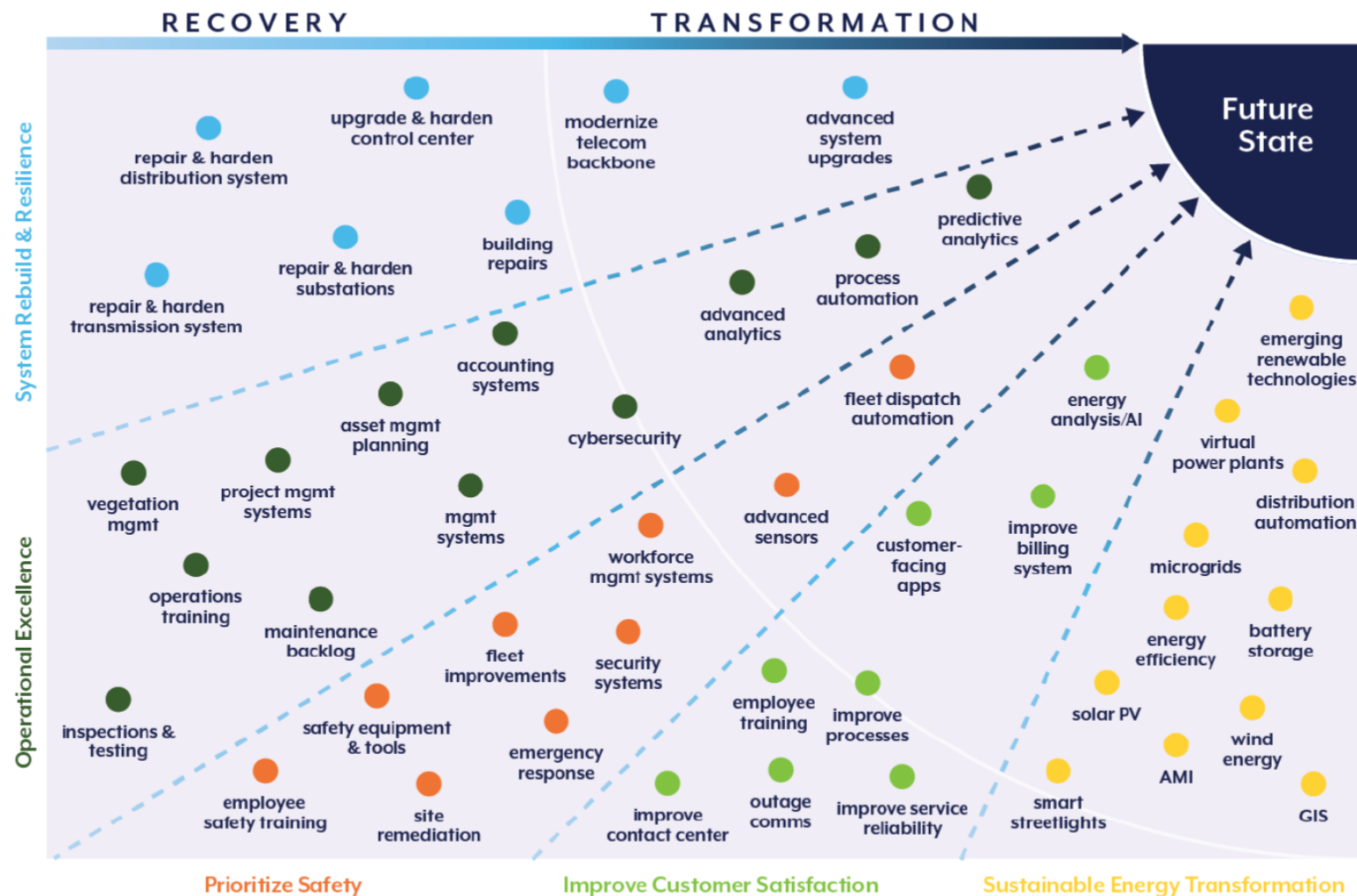
- The Recovery & Transformation framework was a strategic planning process developed during LUMA's Front-End-Transition used to ensure investment planning aligns with Puerto Rico's broader public policy objectives and customer needs.
- The outcome of this planning process was a framework consisting of a mission statement and a set of goals for making progress toward that mission.
- One of these goals is to "modernize the grid and the utility to enable the sustainable energy transformation."
- We then used this planning process to help find a balance of investment, to make progress towards all goals.





# Recovery & Transformation Strategy

- The Recovery phase begins with the restoration of the utility's infrastructure and processes to a well-functioning state.
- As the utility recovers, LUMA will accelerate pace of transformation to incorporate the advanced technologies, systems and workforce needed to operate the utility of the future.
- Not separate, sequential phases.
- Through Phase I Plan, LUMA will work with the Bureau and stakeholders to plan and implement initiatives to prepare the grid and the utility to support increasing adoption of EVs.



# Q&A

# EV Load Management

# LUMA has been working to identify potential quick-start DR pilots and necessary enabling technologies

## Primary Objectives for Quick-Start DR Pilots:

- Identify pilots that could be launched “quickly” given current resource and technology constraints
- Achieve peak demand reductions, to help mitigate under-frequency load shedding events
- Gain experience implementing and operating DR
- Work through current challenges with DR enabling technologies and compensation mechanisms

# Status of DR Programs

## DR Program Development Roadmap



### Current Challenges:

- Enabling technologies
- Program design

### Potential Quick-Start DR Pilots:

- C&I Emergency Peak Reduction (via rate discount, interruptible tariff, and/or TOU rate)
- C&I Economic DR (TOU rate)
- Behavioral DR w/signals via Mi LUMA or text

# EV Load Management Programs

## Potential Residential EV Load Management Programs:

- Passive managed-charging program with TOU rate: meter/tariff change program like NEM
- Website-based consumer education
- Behavioral DR w/signals via Mi LUMA or text

## Next Steps:

- Conduct research to identify most promising initiatives
- Begin research on EV rate design and roadmap for deploying enabling technologies

## Phase I EV Plan Development Roadmap



# Q&A

# Conclusion

- Modernizing the grid and the utility to enable the sustainable energy transformation is one of LUMA's key strategic goals
- EVs are an important part of this transformation, and LUMA is working to implement the improvement programs that will support increased adoption of EVs
- The clean energy transition also requires improved grid planning, interconnection and operations systems, and other initiatives to manage risks and increase reliability
- LUMA looks forward to continued work alongside other stakeholders in Phase I planning process to plan and implement initiatives to support the transition to electric vehicles





Thank You

