

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

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IN RE: OPTIMIZATION PROCEEDING
OF MINIGRID TRANSMISSION AND
DISTRIBUTION INVESTMENTS

CASE NO.: NEPR-MI-2020-0016

SUBJECT: Motion Submitting Presentation
Projected on January 21, 2021; 1st Technical
Workshop

**MOTION SUBMITTING PRESENTATION PROJECTED DURING WORKSHOP
HELD ON JANUARY 21, 2021 IN COMPLIANCE WITH BENCH ORDER**

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

COMES NOW, the Puerto Rico Electric Power Authority, through its counsel, and respectfully submits the presentation titled *The Puerto Rico Electric Power Authority's Analytical Approaches for Optimization* projected during the Technical Workshop held today, January 21st, 2020. Exhibit A.

RESPECTFULLY SUBMITTED.

In San Juan Puerto Rico, this 21st day of January 2021.

s/ Katuska Bolaños-Lugo
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Exhibit A



**Puerto Rico
Electric Power
Authority**

Puerto Rico Electric Power Authority (PREPA)

Analytical Approaches for Optimization
Technical Workshop
January 21st, 2021

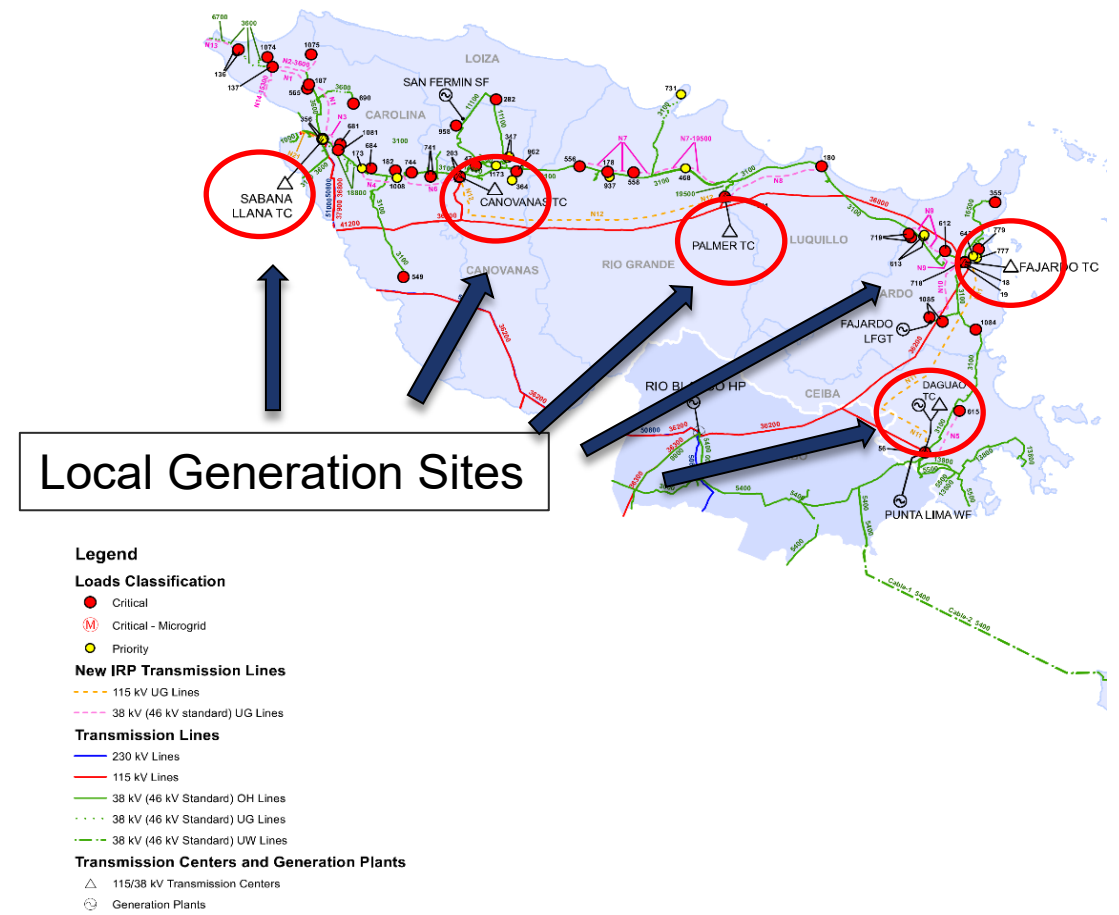
MiniGrids Design Elements

The Design of the MiniGrids (and microgrids) consist of two key elements Local Generation and the local T&D system:

Local Generation Design Elements:

- The MiniGrid must have dependable resources that are to be available shortly after the major event to supply Critical Loads. This includes the on-site emergency generation to bridge the initial hour/days.
- The MiniGrid must have local resources, including both utility scale PV + Storage and DER to supply Critical Loads beyond the capability of the onsite emergency generation and the Priority Loads.
 - *The local generation provides a bridge to bring the PV, Storage and DER online.*
- Balance of loads to be served by the same resources above (thermal, PV + Storage DER), and on grid isolated mode some level of load shed is accepted.
- Microgrid loads covered by reciprocating engines, DER, PV and Storage.

CAROLINA REGION

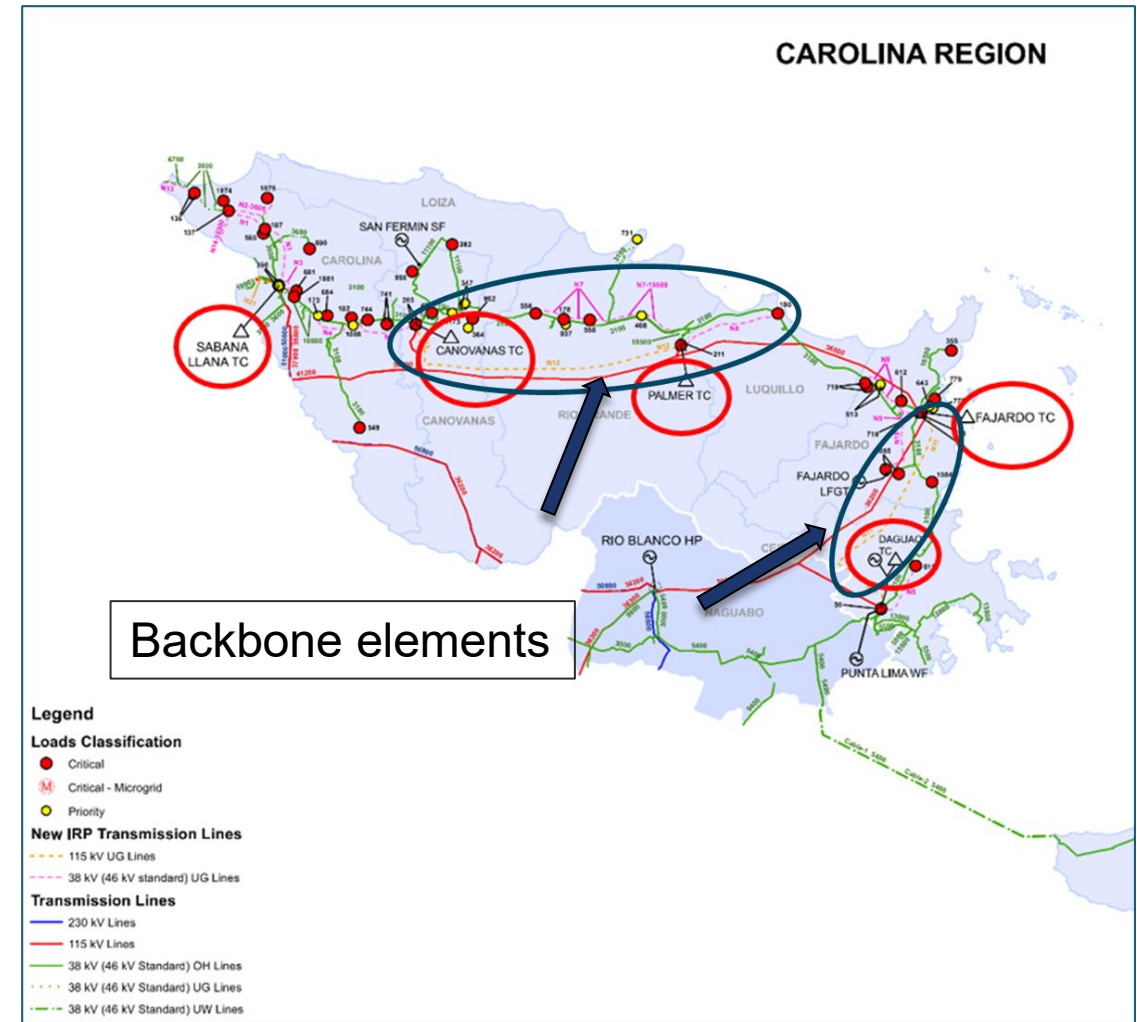


MiniGrids T & D Design

Transmission / Distribution Design Elements:

- Hardening / new underground facilities to create a **MiniGrid backbone** to which local generation is connected and loads are served from.
- **New underground facilities** for interconnection of critical loads (that cannot rely on emergency generation) or **hardened O/H lines** that can be available shortly after the major event for those that do.
- New underground or hardened O/H facilities for the Interconnection of MiniGrids and faster consolidation.
- Hardening of the existing infrastructure or replacing aging infrastructure for MiniGrid as complementary to the above.

PREPA will begin in Q1 2021 performing field assessment and engineering design on T&D assets. Once completed, PREPA can provide further details on the implementation of these design elements



Alignment with the IRP: Transmission Lines

Transmission line projects (**Existing and New**) have been assigned for development in the 10-Year Plan according to the nature of the projects when they are planned for initiation:

- **Project nature: three categories**

- ✓ Hardening and Rebuild of 115 & 230 kV existing lines (including lines needed to support mini-grid development)
- ✓ Hardening and Rebuild of 38 kV existing lines (including lines needed to support mini-grid development)
- ✓ Development of new overhead and underground lines (all 3 voltages, including new lines needed to support mini-grid development)

- **Timeframe for development: three terms**

- ✓ Short-term (2021-2023),
- ✓ Intermediate-term (2024-2027),
- ✓ Long-term (2028 and beyond).



Alignment with the IRP: Transmission Lines (Cont'd)

In general terms, Transmission Line projects in the 10-Year Plan consider both **existing** and **proposed new** lines.

- **Existing lines** include all PREPA overhead transmission lines currently in service for the three voltage levels of 38 kV, 115 kV, and 230 kV; existing transmission lines that are listed in the IRP as necessary to support mini-grid development are included.
 - ✓ Specifically, existing 115 kV and 38 kV lines requiring hardening as defined in the following IRP Exhibits are included: Exhibits 2-11 (115 kV lines) , 24, 36 ,44 ,52, 62, 71 and 84 (sub and switchyard by zone)
 - ✓ The Plan considers the hardening and rebuild of all existing overhead PREPA transmission lines to comply with new consensus-based codes and standards. It also considers the replacement of certain existing underground cables such as segments from the 115 kV San Juan underground loop and the submarine cables to Vieques and Culebra.
 - ✓ Priorities for existing lines were established considering system limitations, feasible operational line outages, and PREPA Operations and T&D recommendations.
- **Proposed new lines** include construction of new overhead and underground lines necessary for improved system reliability, stability, and to allow eventual mini-grid development. New transmission lines listed in the IRP as necessary to support mini-grid development are included.
 - ✓ Specifically, new 115 kV and 38 kV lines as defined in the following IRP Exhibits are included: Exhibits 2-09 (115 kV) and 23, 35, 43, 51, 61, 69 and 83 (38 kV lines and cables by zone).
 - ✓ The Plan considers construction of these new lines to comply with new consensus-based codes and standards.
 - ✓ Priorities for development of new lines were assigned per IRP and Grid Analysis Constraints guidelines.

