FEMA

PREPA 10-Year Infrastructure Plan

June 2021 Update

LUMA

Puerto Rico Electric Power Authority

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I. OVERVIEW OF 10-YEAR INFRASTRUCTURE PLAN UPDATE

February 2021 Update

The February update was the first update to the 10-Year Plan since the initial version was submitted to COR3 and FEMA on December 7th, 2020. This initial update to the PREPA 10-Year Infrastructure Plan was developed in compliance with the PREB's January 25th Order and Resolution, with the intent of aligning the 10-Year Plan to the PREB's August 24, 2020 Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan. As the February update was required by the PREB and was well ahead of the 90-day update requirement of March 22, 2021 for COR3 and FEMA, the February update was submitted only to the PREB.

Although it is PREPA's view that only a few of the 256 projects in the initial version of the 10-Year Plan may have been misaligned with the IRP Order, PREPA took the opportunity to perform a full review of the 10-Year Plan. In performing this review, PREPA focused the highest level of attention on projects planned to start in 2021-2023 and modified approximately 100 projects for scope, approach, cost, timing, or some combination of these.

It is PREPA's objective to fully align with the IRP Order and continue work as quickly as possible on infrastructure investments that are aligned with the IRP Order and critical to the provision of safe, reliable, and cost-effective power to the residents of Puerto Rico.

Revisions included in the February 2021 update of the 10-Year Plan impact the Generation, Transmission, Distribution, and Substation asset categories. Key revisions include:

1. Revisions to Generation projects include a project focused on new combined-cycle generation near the San Juan area (Palo Seco). This project was revised to clarify that current work is constrained to the feasibility study authorized by the PREB in the IRP Order, and in alignment with the cost cap established for this work. In addition, PREPA has updated its approach to new thermal generation peaker units.
2. Revisions to Transmission projects include re-evaluating the set of projects to be started in the next three years and breaking up aggregate projects in this timeframe into individual projects to enhance clarity on the work to be completed and rationale for each.
3. The set of Distribution projects planned for the next three years were also re-evaluated with some projects deferred to later dates. Distribution projects that remained in the next three years were modified to remove undergrounding from scope and focus on hardening of existing overhead lines.
4. Finally, Substation projects were re-evaluated to refine the set of projects to be included in the next three years, deferring some projects to future years in the plan.

March 2021 Update

The March 10-Year Plan update is designed to comply with the 90-day update cycle required by COR3 and FEMA. The March update will be submitted to the PREB, COR3, and FEMA and includes the following changes to the February update described above:

- Transmission, Distribution, and Substation asset category projects were updated based on review and alignment with LUMA Energy. The set of near-term Transmission, Distribution, and Substation projects contained in the March update of the 10-Year Plan are those agreed to by PREPA and LUMA Energy ("LUMA"). A summary of the alignment changes is contained in the table below:

Asset Category	Description of Alignment Updates	Impacted Plan Section(s)
Transmission	Pulled scope from mid and long-term projects into the near-term, creating 21 new stand-alone projects in the near-term	V.D.4
	Adjusted scope and cost of mid and long-term projects based on scope pulled forward to the near-term	V.E.4 and V.F.4
	Pushed four projects back from the near to the mid or long-terms	V.D.4, V.E.4, and V.F.4
Distribution	Pulled scope forward from mid-term to add 47 feeders to existing near-term Distribution projects	V.D.4
	Adjusted scope and cost of mid-term projects based on scope pulled forward to the near-term	V.E.4
	Pushed one near-term project back to the mid-term	V.D.4 and V.E.4
	Eliminated one project from 10-Year Plan due to duplication	V.D.4
Substations	Added two new projects to the 10-Year Plan in the near-term	V.D.4
	Eliminated four near-term projects from the 10-Year Plan	V.D.4

- Projects that did not achieve milestones as planned in 2021 Q1 were rescheduled to subsequent quarters in the near-term. Reasons for rescheduling include:
  - Only one of seven architecture and engineering ("A/E") firms have been approved for work required to meet the first milestone of "Begin 30% A/E Design," thereby limiting the number of projects that can achieve this milestone as planned
  - Work on the 10-Year Plan was temporarily halted in response to the January 25th PREB Resolution and Order; PREPA ceased work for a time to interpret the Order and ensure compliance
  - Some steps in the 10-Year Plan were temporarily halted to allow for in-depth reviews of Transmission, Distribution, and Substation projects with LUMA; during the review cycle, projects were put on hold until they could be verified as priority projects for PREPA and LUMA. Although this resulted in slight delays, it was a critical step to promote alignment between PREPA and LUMA and to ensure projects being pursued represented efficient and effective use of FEMA funds.

- A summary of these rescheduling changes is contained in the table below:

Asset Category	Description of Updates Driven Solely by Milestone Timing	Impacted Plan Section
Generation	11 projects had milestone dates shifted from 2021 Q1 to 2021 Q2	V.D.4
Hydro & Dams	One project had milestone dates shifted from 2021 Q1 to 2021 Q2	V.D.4
Transmission	25 projects had milestone dates shifted from 2021 Q1 to 2021 Q2	V.D.4
Substations	10 projects had milestone dates shifted from 2021 Q1 to 2021 Q2	V.D.4
IT/Telecom	16 projects had milestone dates shifted from 2021 Q1 to 2021 Q2	V.D.4
Buildings	Eight projects had milestone dates shifted from 2021 Q1 to 2021 Q2	V.D.4

June 2021 Update

On June 1, 2021, LUMA assumed overall responsibilities for PREPA's T&D System as outlined within the O&M Agreement between PREPA, P3A, and LUMA. Upon Commencement of the Service Period, PREPA refocused its efforts on projects in the Generation and Dams, Hydro, and Irrigation asset categories; while projects in the Transmission, Distribution, Substations, IT/Telecom, Buildings, and Environmental asset categories ("T&D Projects") were transitioned to, and are now the responsibility of LUMA.

Key changes for the Generation and Dams, Hydro, and Irrigation asset categories include edits to Generation projects in compliance with the PREB March 26th Order, which are summarized in the table below.

Project Name	Description of Change	Impacted Plan Section
New Thermal Generation Feasibility Study	Updated to include renewable energy sources and battery energy storage as part of study	V.D.4
New Thermal Generation Near the San Juan Area	Updated to note this project is to include renewable energy sources and battery energy storage as part of the solution (project to be fully defined based on results of New Thermal Generation Feasibility Study and subsequent PREB review and Order)	V.E.4
New Mobile Emergency Generation	Updated to note that only 81 MW of new gas-fired peaker capacity is approved under the IRP Order and that renewable sources and battery energy storage may be explored to meet the remaining need	V.D.4
Emergency Generation - Yabucoa Units	New Project added to include emergency generation at Yabucoa as part of 81 WM of new gas-fired peaker generation allowed under the IRP Order	V.D.4

New Black Start Unit at Costa Sur	Updated to note that this project will use part of the remaining 81 MW in new gas-fired peaker generation allowed under the IRP Order	V.D.4
New Black Start Unit at Aguirre	Updated to note that project scope and approach is being re-evaluated and the project is subject to the 81 MW limit on new gas-fired peaker generation under the IRP Order	V.E.4

Additionally, Generation and Dams, Hydro, and Irrigation project milestone timing has been reviewed for all projects and updated as required to allow for new information on project approach, available resources, and to incorporate the expected timing for PREB review and approval of projects prior to submission to COR3, FEMA, or any other federal agency.

LUMA's project workload for the next 90-days is consistent with projects presented and approved by PREB. The details of this work is captured in the PREPA-LUMA Supplemental 90-Day Plan submission. LUMA's focus remains on the near term workload and has not contemplated modifications to the mid-term or long-term projects captured in this PREPA 10-Infrastructure Plan.

II. EXECUTIVE SUMMARY

In September 2017, Puerto Rico's electric system was completely devasted by the landfall of Hurricanes Irma and María, resulting in the longest electrical blackout in modern U.S. history. Following the aftermath of the hurricanes, the Puerto Rico Electric Power Authority (PREPA) worked closely with the United States Army Corps of Engineers (USACE), utility partners, contractors, and the Federal Emergency Management Agency (FEMA) to restore electric service to all customers. Although electric service was reestablished successfully, the system was restored using temporary or partial repairs. This approach, while necessary due to the urgent nature of the work, did not remediate the permanent damages suffered during the storms, rendering Puerto Rico's electric grid very vulnerable to future catastrophic events.

In efforts to mitigate the economic, fiscal, and social impacts of future storms, FEMA announced its plans to award two of its largest grants ever, a total of $13 billion, to both rebuild Puerto Rico's electric and water supply system and support recovery of the territory's education system.

As a part of this, a funding obligation of $10.7 billion was earmarked for PREPA to repair and/or replace electrical systems including thousands of miles of transmission and distribution lines, electrical substations, power generation systems, office buildings, and make other grid improvements under FEMA's Public Assistance Alternative Procedures, pursuant to Section 428 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

As a requirement attendant with this funding obligation, FEMA and COR3 requested from PREPA a work plan, called a 10-Year Infrastructure Plan, to be submitted within 90 days of the funding obligation announcement. This plan would outline PREPA's proposed investments in Puerto Rico's electric systems over the next 10 years. In addition, PREPA is required to update and resubmit this work plan to COR3 and FEMA every 90 days after the initial submission.

To satisfy this requirement, PREPA, with support from expert advisors, developed the initial version of the 10-Year Infrastructure Plan and submitted it ahead of the 90-day deadline.

This 10-Year Infrastructure Plan provides an overview of PREPA's infrastructure investment strategy; the context for the selection of projects included in the plan; a prioritized list of these proposed infrastructure projects; the expected benefits, projected costs, key project milestones, and the estimated time horizon for each project; and a brief overview of PREPA's approach to manage execution of this program and the portfolio of projects described herein.

Although this plan is only required by COR3 and FEMA to address PREPA's plans for the 428-obligated funds, PREPA has taken the approach of developing a plan that includes all planned infrastructure investments regardless of funding source. This is being done to provide a holistic view of the work to be performed on PREPA's system and a view for how the 428 funds will support PREPA's overall infrastructure investment strategy and approach.

Projects in this plan will include funding from the FEMA 428 and 404 mitigation programs, HUD Community Development Block Grant (CDBG) program, and PREPA's Necessary Maintenance Expense (NME) program.

Investment Strategy Overview

The investment strategy for development of this 10-Year Infrastructure Plan was guided by several foundational elements based on work previously completed by PREPA, its advisors, and other key stakeholders such as FEMA and COR3. These foundational elements include the development of PREPA's Governing Board Vision Statement, FEMA's Damage Assessment Reports, Puerto Rico's Integrated Resource Plan (IRP), PREPA Certified Fiscal Plan(s), Puerto Rico Energy Public Policy Act 17, Sargent & Lundy's (S&L) Engineering Reports including a T&D Roadmap and various Independent Engineer's Reports, as well as components of the COR3's Energy System Modernization Plan.

PREPA and its technical advisors leveraged the information in each of these foundational elements and performed additional analysis to guide the selection of the projects in this 10-Year Infrastructure Plan.

As a result of this process, five investment focus areas were designated to crystallize the intent of what the projects in this plan, taken together, will achieve. In addition, a comprehensive analysis was conducted by PREPA and its lead technical advisor, Sargent & Lundy, to establish projects that address the requirements of PREPA's IRP, including applicable local and federal laws and regulations.

Table 1.1 summarizes the five investment focus areas that were designated and provides illustrative components within each area.

Table 1.1 – Summary of Investment Focus Areas

Reliability and System Resiliency	Renewable Integration	Codes, Standards, & Reg. Compliance	Automation and Modernization	Hazard Mitigation
▪ *Hardening* ▪ *Advanced Metering Infrastructure* ▪ *Circuit Undergrounding* ▪ *Black Start Systems* ▪ *Supplemental, Flexible, Dispatchable, Generation Energy Management System (EMS)*	▪ *Renewable Energy (e.g., solar and wind)* ▪ *Hydroelectric Revitalization* ▪ *Battery Storage* ▪ *Synchronous Condensers*	▪ *Environmental – Soil Stabilization and Restoration* ▪ *Codes and Standards* ▪ *Access Roads and Right of Way*	▪ *Supervisory Control and Data Acquisition (SCADA) System* ▪ *Advanced Distribution Management System (ADMS)* ▪ *Cybersecurity* ▪ *Field Area Network (FAN)* ▪ *Control Centers*	▪ *Flood and Wind Mitigation* ▪ *Damaged Infrastructure Repairs* ▪ *Physical Security Improvements* ▪ *New or Expanded Substations* ▪ *Line Relocation or New Builds* ▪ *Mobile Emergency Generation*

Asset Categories and Prioritization Approach

Upon review of the foundational elements and additional analyses, PREPA examined more than 2,000 sub-projects which could be incorporated into the 10-Year Plan. The sub-projects selected for the plan have since been consolidated into 305 larger projects.

The 305 projects in the plan were organized in eight distinct asset categories. Asset categories in the initial version of the plan were based on the categorization approach used to reach the FEMA 428-funding obligation. PREPA retained the seven asset categories from that funding obligation and added one additional asset category, Environmental.

Table 1.2 provides the eight asset categories used for the original 10-Year Plan.

Table 1.2 – Summary of Asset Categories

Generation	Dams/Hydro	Transmission	Distribution
Includes new renewable and potentially thermal power plant generation, grid support centers, thermal power plant retirements, mobile emergency power generation, and plant improvements	*Includes dam safety and early warning systems, reservoirs, hydroelectric facilities, and irrigation canals*	*Includes transmission line restoration and hardening and transmission reconfiguration*	*Includes feeder, pole, transformer, and conductor replacements, intelligent device and distribution automation installation, and smart meter installation*
Substations	**IT/Telecom**	**Buildings**	**Environmental**
Includes distribution substations, transmission centers, and transmission/generation separation	*Includes fiber optic and microwave systems, SCADA, VLAN, and two-way and wireless radio systems*	*Includes flooded and severely damaged buildings as well as minor damages*	*Includes demolition, soil stabilization, and restoration projects*

Asset category teams comprised of PREPA and its advisors were formed for each asset category to identify the projects for inclusion in the 10-Year Plan, prioritize the projects, and develop the right sequencing for FEMA submission, approval, and subsequent execution.

For each project included in the 10-Year Plan, the asset category teams developed a project description, prepared a high-level cost estimate, and identified potential funding sources. The asset category teams also prioritized each project into one of three-time horizons: near-term (i.e., 2021-2023), mid-term (i.e., 2024-2027), and long-term (i.e., 2028 and beyond).

Four standard major milestones were defined and standardized across all projects in the 10-Year Plan. The timing for each major milestone, for each project, was estimated by the asset category team.

The four standardized major milestones are:

1. Project expected to commence 30% architecture and engineering (A/E) work
2. Project expected to be submitted to COR3 and FEMA for review and approval
3. Project expected to commence construction/implementation
4. Project expected to commence FEMA and COR3 closeout activities

Projects were assigned to a time horizon based on when the first major milestone of the project, A/E work, is expected to commence.

Prioritization methodology was based on the considerations most germane to each asset category team, but some of the common criteria evaluated by all the teams include:

- Currently out of service and/or damaged infrastructure
- Safety, environmental, and regulatory compliance needs
- System operation needs and grid constraints
- Impacts to reliability performance and/or critical load infrastructure
- Severe storm hazard mitigation
- Renewable integration and/or support for renewable integration

Plan Overview

The June version of the 10-Year Infrastructure Plan includes approximately $12.8 billion in investment that is needed for PREPA and LUMA to rebuild and transform Puerto Rico's electric system, most of which qualifies for FEMA funding under its 428 and 404 mitigation programs. The $12.8 billion includes funds to be requested from these programs, plus supplemental funding from PREPA's NME program.

To be clear, this estimate includes only the cost associated with FEMA 428 funds, FEMA 404 funds, and PREPA's NME funds. It therefore excludes infrastructure hardening work that is eligible for funding through FEMA's 406 Public Assistance Mitigation (406) program.

PREPA and LUMA are to submit proposals for 406 funding with each of their applicable 428 proposals. This approach will ensure the integrity of the process given the differing requirements of each funding source.

FEMA's 406 program is designed to provide funding to rebuild infrastructure in excess of industry standards to prevent damage from future disaster events, which is also referred to as "hardening" of assets.

As described above, and in alignment with COR3 and FEMA's process, PREPA and LUMA will submit proposals for 406 funding with each of their applicable 428 project submittals. These hardening proposals will add cost that is not currently included in this plan. However, the additional cost is expected to be offset by funding through FEMA's 406 program.

Table 1.3 summarizes the plan by asset category and funding source.

Table 1.3 – Total Estimated Cost by Asset Category and Funding Source

Asset Category	FEMA 428 ($M)	FEMA 404 ($M)	NME Funds ($M)	Estimated Total Cost[1] ($M)
Generation	$84	$878	$294	$1,256
Dams, Hydro, and Irrigation	$862	$658	$0	$1,520
Transmission	$3,842	$0	$0	$3,842
Distribution	$4,191	$0	$0	$4,191
Substations	$774	$4	$340	$1,118
IT/Telecom	$686	$0	$92	$778
Buildings	$63	$0	$0	$63
Environmental	$15	$0	$0	$15
Total	**$10,517**	**$1,540**	**$726**	**$12,783**

It is important to note that all cost estimates provided in this document are "class 5" estimates. A class 5 cost estimate is one that is prepared at an early stage in the project development process and is expected, based on industry standards, to range from 50% below to 100% above the actual final project cost. Leading industry practice is to revise estimates, so they become more accurate as engineering design progresses and project requirements are solidified.

In addition to the funding sources discussed above, PREPA and LUMA will seek to leverage funds from Community Development Block Grant Disaster Recovery (CDBG-DR) for the 10% cost share allocation.

Forecast capital investment projections for each project are scoped to include all project activities from the point at which the project commences initial architectural and engineering work through the completion of project closeout activities.

Several projects within the 10-Year Infrastructure Plan extend throughout the entire 10-year period. Examples of such projects are Advanced Metering Infrastructure (AMI), Advanced Distribution Management System (ADMS), Streetlights Repair Program, Distribution Automation, Control Centers, Guajataca Dam Repairs, and others.

Figure 1.1 illustrates the forecast capital investment by year and asset category, and Figure 1.2 illustrates the estimated cost-share allocation needs by year.

[1] All costs, funding sources, and subtotals are estimates subject to change.

Figure 1.1 – Forecast Capital Investment by Year and Asset Category ($ millions)

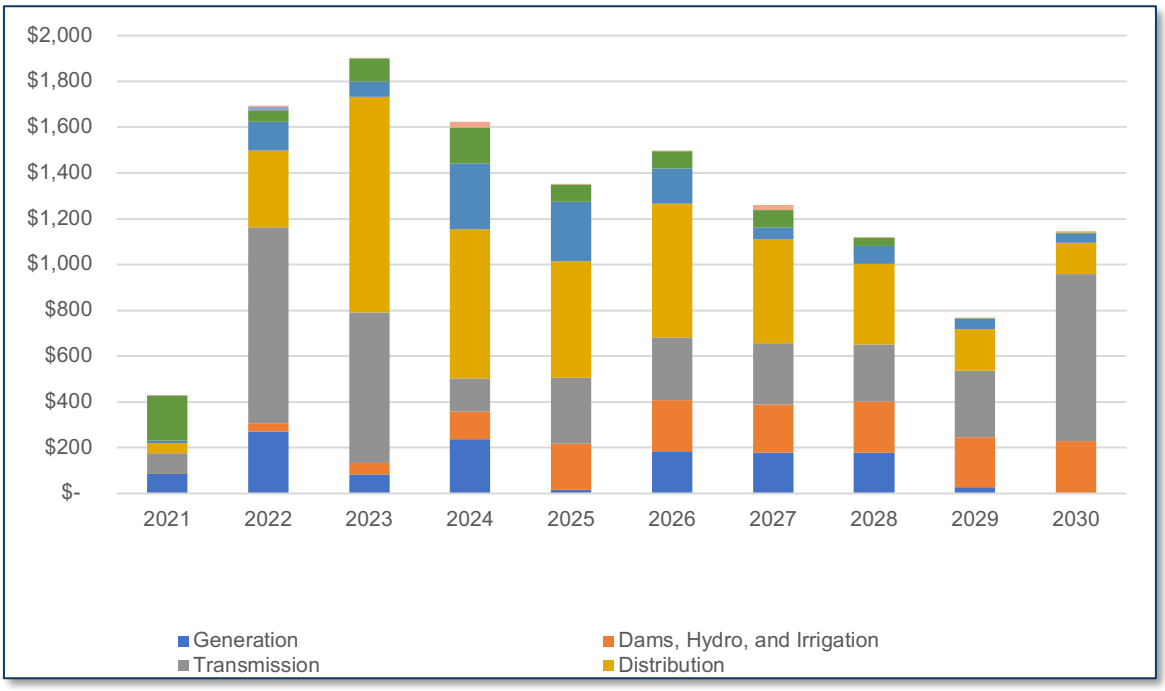
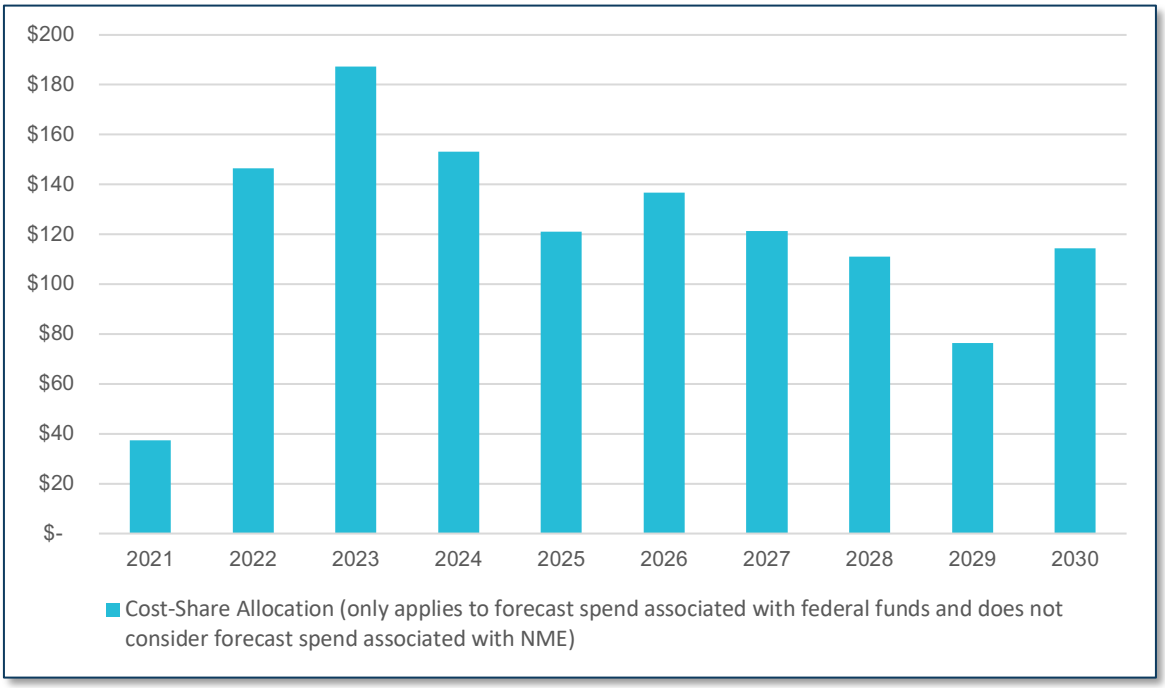


Figure 1.2 – Estimated Cost-Share Allocation by Year ($ millions)



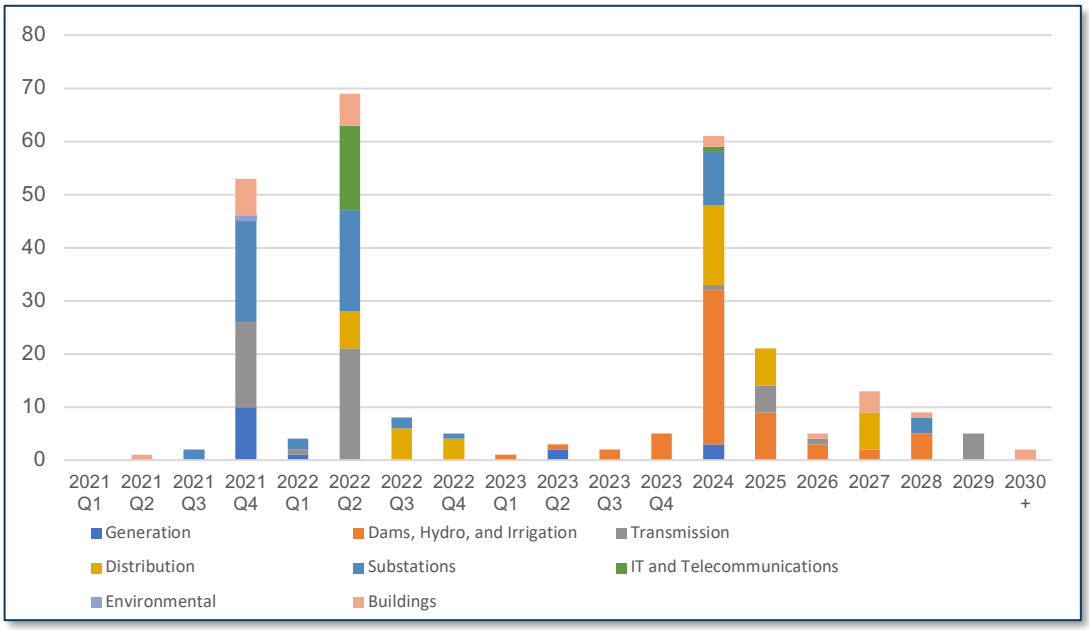
As discussed above, 305 projects were identified, prioritized, and included in the 10-Year Plan. Table 1.4 illustrates the distribution of these projects by asset category and by time horizon.

Table 1.4 - Number of Projects by Asset Category and Time Horizon

Asset Category	Near-Term (2021-2023)	Mid-Term (2024-2027)	Long-Term (2028 +)	Total
Generation	31	5	0	**36**
Dams, Hydro, and Irrigation	30	22	5	**57**
Transmission	38	7	5	**50**
Distribution	17	29	0	**46**
Substations	53	18	3	**74**
IT/Telecom	16	1	0	**17**
Buildings	14	7	3	**24**
Environmental	1	0	0	**1**
Total	**200**	**89**	**16**	**305**

Figure 1.3 provides the estimated timeframe as to when each project is expected to be submitted to FEMA for review and approval. The number of projects is expected to change over time as PREPA works in close collaboration with FEMA and COR3 to evaluate each individual project and optimize its strategy for project submission and evaluation.

Figure 1.3 – FEMA SOW Submission Timeline



As the size and location of new renewable energy and energy storage resources will be determined in the near to mid-term periods, the timing, sequence, scope, and priority of certain projects and sub-projects may need to be adjusted, including essential elements of grid support systems such as synchronous condensers. Additionally, project milestone dates are based on the best available information at the time and are subject to change in future updates to the 10-Year Plan.

The sections that follow provide additional information about each of the priority categories, near-term, mid-term, and long-term.

Near-Term Projects Profile (2021-2023)

The near-term priority category is comprised of 200 projects. These projects either have already begun 30% architectural and engineering (A&E) design or are expected to do so in years 2021, 2022, and 2023.

The in-scope estimated cost of projects expected to begin within this time horizon is $6.03 billion. Figure 1.4 illustrates the breakdown of estimated cost by asset category for projects commencing during this time period. Table 1.5 provides a representative sample of notable projects slated to commence during this period.

Figure 1.4 – Total Estimated Cost by Asset Category for Near-Term Projects ($M)

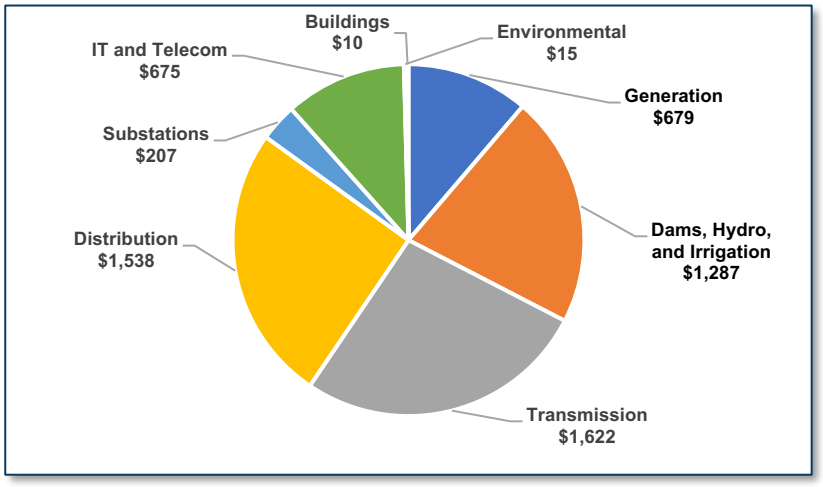


Table 1.5 – Near-Term (2021-2023), Notable Projects

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Generation	Tranches 1-6 of Renewable Energy and Battery Storage Projects (Note: These projects and assets will be owned by 3rd parties who will enter	TBD *$/kWh (Based on Market Pricing)*	2021 Q2	N/A

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
	into offtake agreements with PREPA)			
Generation	New Black Start System at Costa Sur	$45.20	2021 Q2	2023 Q2
Generation	Emergency Generation - Yabucoa Units	$45.50	2021 Q3	2022 Q1
Generation	New Thermal Generation Feasibility Study	$5.00	2021 Q4	N/A
Generation	Synchronous Condensers	TBD	2022 Q2	2023 Q1
Dams, Hydro, and Irrigation	Early Warning System (Dams) Project	$100.00	2022 Q3	2023 Q3
Dams, Hydro, and Irrigation	Guajataca Dam - establish the phases here - Study/Assessment - Detailed Design - Procurement	$566.09	2023 Q2	2024
Dams, Hydro, and Irrigation	Patillas Dam - Seismic Retrofit	$558.00	2022 Q1	2023 Q4
Transmission	Set of projects to harden and/or rebuild 230 kV, 115 kV, and 38 kV transmission lines to conform with consensus-based codes and standards through projects approved by the PREB	$855.87	2021 Q3	2021 Q4
Transmission	San Juan 115kV Underground Transmission Loop	$10.00	2021 Q3	2021 Q4
Distribution	Restore and harden distribution feeders serving critical loads in the San Juan region to conform with consensus-based codes and standards	$78.53	2021 Q4	2022 Q2 – 2022 Q4
Distribution	Restore and harden distribution feeders serving critical loads in the Bayamón region to conform with consensus-based codes and standards	$161.03	2021 Q4	2022 Q2– 2022 Q4
Distribution	Restore and harden distribution feeders serving critical loads, in the Carolina region to conform with consensus-based codes and standards. This group includes feeders for Vieques and Culebra that have been approved by the PREB.	$151.43	2021 Q4	2021 Q4– 2022 Q4
Distribution	Restore and harden distribution feeders serving critical loads in the Arecibo region to conform with consensus-based codes and standards	$127.49	2021 Q4	2022 Q2– 2022 Q3

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Distribution	Restore and harden distribution feeders serving critical loads, in the Ponce region to conform with consensus-based codes and standards	$82.99	2021 Q4	2022 Q2 – 2022 Q3
Distribution	Restore and harden distribution feeders serving critical loads in the Mayagüez region to conform with consensus-based codes and standards	$416.18	2021 Q4	2022 Q2– 2022 Q4
Substation	Transmission and distribution substation projects approved by the PREB	$84.70	2021 Q3	2021 Q4
IT / Telecom	MPLS Network Deployment	$150.92	2021 Q1	2022 Q2
IT / Telecom	Advanced Distribution Management System (ADMS)	$48.02	2021 Q1	2022 Q3
IT / Telecom	Advanced Metering Infrastructure (AMI)	TBD	2021 Q1	2022 Q2
IT / Telecom	Next-generation Field Area Network (FAN)	$93.60	2021 Q1	2022 Q2
IT / Telecom	Cybersecurity Program Implementation	$74.30	2021 Q1	2022 Q2

Mid-Term Projects Profile (2024-2027)

The mid-term priority category is composed of 89 projects that are expected to begin 30% A&E design in years 2024, 2025, 2026, and 2027.

The in-scope estimated cost of projects expected to begin within this time horizon is $5.85 billion. Figure 1.5 illustrates the breakdown of estimated cost by asset category for projects commencing during this time period. Table 1.6 provides a representative sample of notable projects slated to commence during this period.

Figure 1.5 – Total Estimated Cost by Asset Category for Mid-Term Projects ($M)

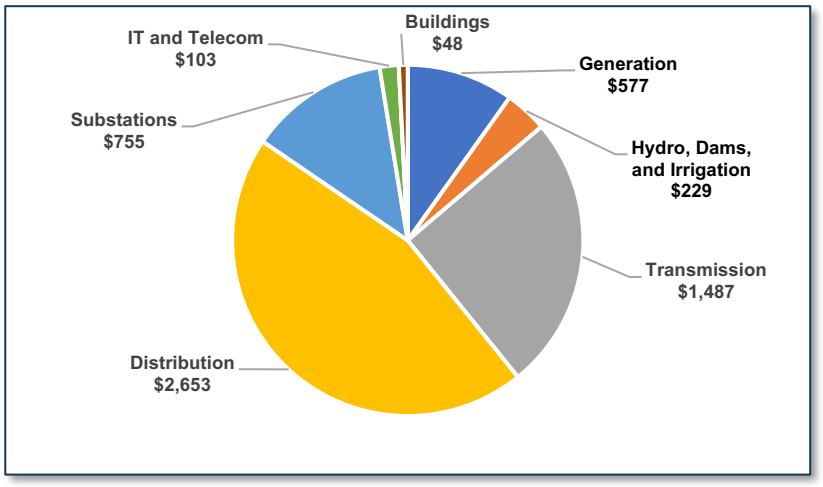


Table 1.6 – Mid-Term (2024-2027), Notable Projects

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Generation	New Generation in San Juan Area	$572.40	2024	2024
Dams, Hydro, and Irrigation	Dos Bocas Reservoir	$58.25	2024	2024
Dams, Hydro, and Irrigation	Lajas Lateral Canals	$55.33	2025	2026
Dams, Hydro, and Irrigation	Caonillas Reservoir	$41.74	2024	2024
Transmission	In aggregate, mid-term 115kV and 230kV transmission projects are designed to harden and/or rebuild 37 transmission lines (≈ 496 mi) to conform with consensus-based codes and standards	$475.54	2025	2025
Transmission	In aggregate, mid-term 38kV transmission projects are designed to harden and/or rebuild 49 transmission lines (≈ 636 mi) to conform with consensus-based codes and standards	$506.18	2025	2025
Transmission	In aggregate, mid-term new transmission line projects are designed to build 29 new underground or overhead transmission lines across all three voltage levels (38 kV, 115 kV, and	$505.67	2024	2026

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
	230 kV) to provide redundancy to existing lines damaged in the disaster			
Distribution	In aggregate, San Juan region distribution projects are designed to harden or underground 257 Distribution Feeders, including critical loads, to conform with consensus-based codes and standards	$863.41	2025	2025
Distribution	In aggregate, Arecibo region distribution projects are designed to harden or underground 99 Distribution Feeders, including critical loads, to conform with consensus-based codes and standards	$767.19	2025	2025
Distribution	In aggregate, Ponce region distribution projects are designed to harden or underground 87 Distribution Feeders, including critical loads, to conform with consensus-based codes and standards	$865.18	2025	2025
Distribution	In aggregate, Mayagüez region distribution projects are designed to harden or underground 138 Distribution Feeders, including critical loads, to conform with consensus-based codes and standards	$704.13	2025	2025
Distribution	Smart Street Lighting – All Regions	$185.50	2024	2024
Substation	San Juan 115kV GIS	$64.60	2024	2024
Substation	Grid Concern Substation projects are designed to modernize and harden equipment at numerous distribution and transmission substations	$204.00	2024	2024
IT / Telecom	SCADA – RTU Protocol Conversion from serial to ethernet	$102.90	2024	2024

Long-Term Projects Profile (2028 and beyond)

The long-term priority category is composed of 16 projects that are expected to begin 30% A&E design in years 2028 and beyond.

The in-scope estimated cost of projects expected to begin within this time horizon is $0.90 billion. Figure 1.6 illustrates the breakdown of estimated cost by asset category for projects commencing during this time period. Table 1.7 provides a representative sample of notable projects slated to commence during this period

Figure 1.6 – Total Estimated Cost by Asset Category for Long-Term Projects ($M)

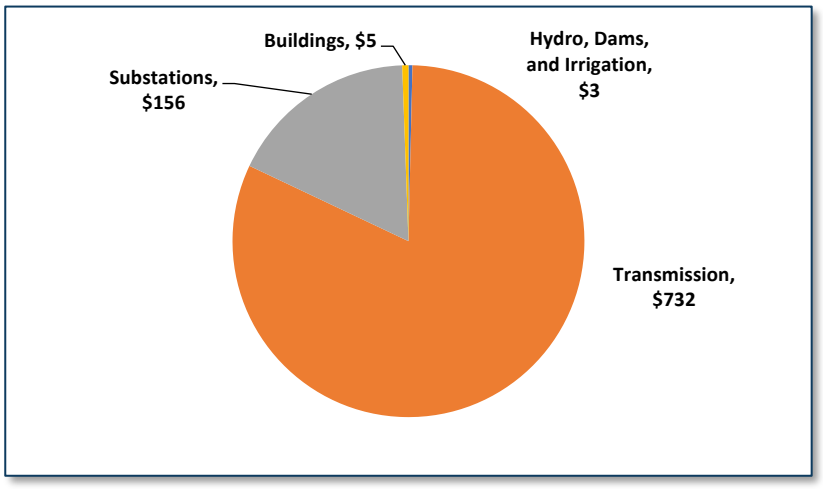


Table 1.7 – Long-Term (2028 and beyond), Notable Projects

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Dams, Hydro, and Irrigation	Yahuecas Dam	$2.73	2028	2028
Transmission	Harden and/or rebuild 30 Transmission Lines (≈ 372 mi) of 115 kV and 230 kV to conform with consensus-based codes and standards	$322.65	2029	2029
Transmission	Harden and/or rebuild 79 Transmission Lines (≈ 294.1 mi) of 38 kV to conform with consensus-based codes and standards	$276.48	2029	2029

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Transmission	New build of 6 underground or overhead Transmission Lines across all three voltage levels (38 kV, 115 kV, and 230 kV) to provide redundancy to existing lines damaged in the disaster	$101.00	2028	2029
Substation	Grid Concern Substations – Modernize and hardened the equipment at multiple 3 distribution and 106 transmission substations	$97.74	2028	2028
Substation	Modernization & Hardening Substations – Modernize and hardened the equipment at multiple 12 distribution and 1 transmission substations, including 4 transmission line terminals	$52.13	2028	2028

Project and Portfolio Management

PREPA and LUMA have implemented Enterprise Project Management (EPM) programs with project management standards and controls in accord with leading practices.

These EPM programs are further based on leading practices and is comprised of these components: a strong centralized governance of the portfolio of projects; a standard, rigorous process from project initiation to closeout for all projects in the portfolio; a centralized system to provide a single source of truth for all projects (with particular focus on scope, schedule, and budget); and standardized project controls across PREPA and LUMA.

The EPM program is outlined in Table 1.8 below.

Table 1.8 – EPM Foundational Components

Strong Governance	Standard Project Management Process	Centralized System	Project Controls
▪ *Strong governance and oversight, by senior executives, of all projects* ▪ *Project justification is rigorous, documented, and includes assessment of costs, benefits, and alternative course of action* ▪ *Project authorization is based on a well-defined process with clear roles and responsibilities* ▪ *Authorized projects work together as a cohesive portfolio of projects*	▪ *Rigorous process for the management of each project with clear accountabilities* ▪ *Consistent standards based on leading practices for managing and governing all PREPA projects* ▪ *Holistic governance, oversight, and optimization of the portfolio of PREPA projects*	▪ *Single source of the truth for project to:* – *Create transparency for project performance, especially scope, schedule, and budget* – *Enable accountability and performance management* ▪ *Provides integrated portfolio view* ▪ *Automates approval workflows to improve controls and efficiency*	▪ *Proper quality management controls* ▪ *Effective project management controls and execution procedures, including risk management* ▪ *FEMA grant and fund management controls to ensure compliance* ▪ *Leading practice executive portfolio dashboards, project reports, and monthly operating sequences*

III. INTRODUCTION

The purpose of this document is to provide an overview of the current infrastructure investment plan for the next decade, covering projects initiated in the years 2021-2030.

This plan is being submitted to COR3 and FEMA to satisfy the requirement for a work plan to be submitted within 90 days of the $10.7 billion funding obligation under the Stafford Act, Section 428 Public Assistance (428) program, and is required to be updated and resubmitted to COR3 and FEMA every 90 days after the initial submission. Accordingly, we have conferred with FEMA and COR3 during plan development in order to gain the best possible understanding of their requirements for this plan and to meet those requirements.

This 10-Year Infrastructure Plan is not subject to approval by COR3 or FEMA nor does it secure the release of any obligated 428 funds. Rather, the plan serves as a working document to provide context for and support collaboration among PREPA, COR3, and FEMA in the process of developing and submitting individual projects for review, approval, and funds disbursement. Importantly, that process begins now. Submission of this plan is an important first step followed by submitting individual project funding requests and beginning 30% A/E design for 2021 projects.

Although this plan is only required by COR3 and FEMA to address PREPA's plans for the 428-obligated funds, PREPA has taken the approach of developing a plan that includes all planned infrastructure investments, regardless of funding source. This is being done to provide a holistic view of the work to be performed on PREPA's system and a view for how the 428 funds will support PREPA's overall infrastructure investment strategy and approach. Projects in this plan include those that are eligible for funding from the FEMA 428 and 404 Mitigation (404) programs, the HUD CDBG program, and projects that will require some self-funding through PREPA's NME program.

This document will provide:

- An overview of the infrastructure investment strategy, to provide context for the selection of projects in the plan
- A prioritized list of the infrastructure projects that comprise the plan with brief descriptions and class 5 cost estimates
- A section that shows the estimated timing of key project milestones by quarter for 2021-2023 and by year for 2024-2030
- An overview of PREPA and LUMA's EPM program that will be instrumental to management of the infrastructure portfolio described herein, including governance, oversight, and controls.

These document elements were designed to be responsive to COR3 and FEMA's request for information to be provided under their 428-work plan requirement.

The major projects identified in this plan, together with their associated timeline, provide a framework outlining the work and an expected sequence for its execution.

While much of the pre-existing electrical infrastructure has been restored, PREPA and LUMA continue to provide service to customers in a fragile state, challenged most recently by tropical storms and seismic activity in 2020.

There are engineering challenges with replacing an operating system that millions of residents and businesses depend upon 24/7. Moreover, 10 years is a long-planning horizon. As such, and as FEMA has explained to us, adjustments to this 10-Year Infrastructure Plan are expected—whether driven by study results, natural events, advances in technology, implementation or scheduling constraints, or other influences.

This plan is based on the most current information available to PREPA and LUMA and will be updated on a quarterly basis. With this submittal, PREPA and LUMA intend to execute a set of defined, effective, multi-faceted projects to transform Puerto Rico's electrical grid as described herein.

The 10-Year Infrastructure Plan was prepared by a team of individuals that included direction, oversight, and guidance from PREPA and LUMA leadership as well as technical support from professional firms in the areas of engineering, grant management, and project management.

IV. INFRASTRUCTURE INVESTMENT STRATEGY

Context

In the aftermath of the 2017 hurricane season, PREPA suffered great losses across much of its electric power grid. Sequential Hurricanes, Irma followed by María, devastated the electrical transmission and distribution system. After facing the challenge of restoring the system from these disastrous events, PREPA faced the additional and necessary challenge of making the infrastructure stronger and less vulnerable to future storms while delivering a more reliable and resilient supply of power to its customers.

Since that time, a series of foundational steps have been taken that have set the path to transforming Puerto Rico's electric sector. Some of these events include the development of PREPA's Governing Board Vision Statement, Puerto Rico Energy Public Policy Act 17, Puerto Rico's Integrated Resource Plan (IRP), PREPA Certified Fiscal Plan(s), FEMA's Damage Assessment Reports, Sargent & Lundy's (S&L) T&D Roadmap accompanied by other feasibility studies, and COR3's Energy System Modernization Plan.

These steps provide the foundation for this plan. Table 3.1 illustrates the five foundation components of PREPA's 10-Year Infrastructure Plan.

Table 3.1 – Foundational Components of 10-Year Infrastructure Plan

PREPA's Vision Statement	*Aligns and motivates all stakeholders on the future plans, structure, and objectives of the Puerto Rico electric utility. It addresses the need for a transformed electrical system with statements grounded on five fundamental principles: Customer-Centric, Financially Viable, Reliable and Resilient, Model of Sustainability, and Economic Growth Engine for Puerto Rico.*
Puerto Rico Energy Public Policy Act 17	*Establishes parameters for a resilient, reliable, and sustainable energy system for all customers classes, makes it feasible for energy system users to produce and participate in energy generation, facilitates the interconnection of distributed generation systems and microgrids, and unbundles the electrical power system into an open system. Sets renewable portfolio standard (RPS) targets of 40% by 2025, 60% by 2040, and 100% by 2050.*
Puerto Rico's Integrated Resource Plan (IRP)	*Provides a roadmap to meet expected electricity demand over a set planning horizon through the future development of the utility's electrical infrastructure with specific plans to improve the resiliency and reliability of its electrical generation and delivery systems; reduce the cost of energy to customers; and limit PREPA's future*

	dependence on fossil fuels as it transitions to a system that is more heavily based on renewable generation.
PREPA Certified Fiscal Plan (s)	*Lays out the path for operational and financial restructuring of the Puerto Rico Electric Power Authority (PREPA) in order to enable the transformation of Puerto Rico's energy system and exit the Title III bankruptcy process.*
FEMA's Damage Assessment Reports	*Provides a description of the damages, related causes, location, and dimensions of the equipment and facilities damaged during the 2017 hurricanes and other catastrophic events.*
Sargent & Lundy's T&D Roadmap	*Provides the planning, framework, and project development plans of more than 3,500 T&D projects that touch all aspects of the grid system including transmission, distribution, substation, grid modernization, telecommunications, generation, and system operations to improve the overall reliability and resiliency of the utility.*
COR3's Energy System Modernization Plan	*Provides an initial transformation approach and input for the permanent reconstruction of a more reliable, resilient, and decentralized Puerto Rico energy system. Serves as an initial guide to fund repair and reconstruction activities in the energy sector and to initiate FEMA program-funding support activities.*

Overview of Investment Strategy

PREPA and its technical advisors leveraged the foundational components outlined in Table 3.1 and performed additional analysis to guide the selection of the projects in this 10-Year Infrastructure Plan.

To align and guide our work, we designated five investment focus areas that summarize the intent of what our projects will collectively achieve.

In addition, a comprehensive analysis was conducted by PREPA and its lead technical advisor, Sargent & Lundy, to establish projects that address the requirements of PREPA's IRP, including applicable local and federal laws and regulations.

Table 3.2 – Investment Focus Areas

Reliability and System Resiliency	*Provide safe, adequate, and reliable service while ensuring the electric system is prepared for, able to respond to, and recover from any events causing outages. Examples include:* ▪ *Transmission and Distribution Hardening* ▪ *Advanced Metering Infrastructure (AMI)* ▪ *Circuit Undergrounding* ▪ *Black Start Systems* ▪ *Supplemental, Flexible, Dispatchable Generation* ▪ *Energy Management System (EMS)*
Renewable Integration	*Support and enable the rapid and substantial increase of renewable generation and energy storage. Examples include:* ▪ *Renewable Energy (e.g., solar and wind)* ▪ *Hydroelectric Revitalization* ▪ *Battery Energy Storage* ▪ *Synchronous Condensers*
Codes, Standards, and Regulatory Compliance	*Ensure compliance with applicable laws and regulations and alignment with consensus-based codes and standards. Examples include:* ▪ *Environmental – Soil Stabilization and Restoration* ▪ *Codes and Standards (e.g., Buildings, Dams, Wind Speed, Protection and Controls, Feeder Loading, etc.)* ▪ *Access Roads and Right of Way*
Automation and Modernization	*Enable and support the automation and modernization of electric system operations, including telecommunications, connectivity, and security of utility assets. Examples include:* ▪ *Supervisory Control and Data Acquisition (SCADA) System* ▪ *Advanced Distribution Management System (ADMS)* ▪ *Cybersecurity* ▪ *Field Area Network (FAN)* ▪ *Control Centers*
Hazard Mitigation	*Reduce or eliminate risk(s) to grid operations, people, or property from future disasters. Examples include:* ▪ *Flood and Wind Mitigation* ▪ *Damaged Infrastructure Repairs* ▪ *Physical Security Improvements* ▪ *New or Expanded Substations* ▪ *Line Relocation or New Builds* ▪ *Mobile Emergency Generation*

Investment Strategy Highlights – Generation Infrastructure

The Puerto Rico Energy Bureau (PREB) reviewed the IRP plan and issued its Final Resolution on August 24, 2020, providing detailed findings, conclusions, and orders to PREPA. Some of the key mandates included in the IRP Resolution include:

- Retirement of a significant number of existing oil-fired thermal units in the next five years, including Aguirre 1 and 2; Palo Seco 1, 3, and 4; and San Juan 7, 8, 9, and 10
- Retirement of AES' coal-fired power plant by 2027
- Retirement of Aguirre diesel-fired Combined Cycle Units 1 and 2 by 2030
- Integrate renewable generation projects to achieve a 40% renewable portfolio standard (RPS) by 2025; 60% by 2040; and 100% by 2050, in line with Puerto Rico Energy Policy Act 17
- Renewable energy projects and energy storage projects will primarily be owned by 3rd parties. PREPA will enter into Power Purchase and Operating Agreements (PPOAs) or Energy Storage Service Agreements (ESSAs) with the projects.

This rapid and substantial addition of renewable generation and energy storage systems coupled with the significant retirement of existing gas and thermal generation requires extensive planning and analysis work. The challenge resides in identifying the projects within the 10-Year Infrastructure Plan that will enable the penetration of renewable generation and integration with ongoing grid modernization projects, while ensuring the reliable operation and maintenance of the grid. PREPA studies regarding renewable integration system impacts and support infrastructure requirements show that system stability could be compromised under certain operational and weather conditions, including elevated grid stability risks as instantaneous inverter-based generation levels reach and exceed 60%. PREPA is currently analyzing system impacts from its existing renewable generation facilities to forecast system impacts under higher renewable penetration levels currently planned for integration. In response to PREB's guidance, PREPA has identified several key Generation infrastructure projects that, based on its studies and analysis, are required to enable the effective execution of PREB's guidance within the constraints of systems operations, reliability, and maintenance.

Table 3.3 – Strategic Projects, Generation Infrastructure

Project	Enabling Factors
New Thermal Generation Feasibility Study	▪ This feasibility study will be conducted in alignment with the PREB's IRP Resolution and Order and will be focused on preliminary economic, siting, permitting, and planning analysis regarding a new fossil-fuel powered unit near the San Juan area (Palo Seco). ▪ The feasibility study will take into account responses to PREPA's renewable energy and energy storage RFPs; indicative pricing for combined-cycle generation, reciprocating engine projects, and combustion engine generators; siting and feasibility analysis for fueling

Project	Enabling Factors
	infrastructure; and opportunity cost to siting battery energy storage systems or renewable resources near the San Juan area (Palo Seco) as a result of fossil-fuel generation development. ▪ Per the PREB's March 26th Order, the feasibility study will include renewables and battery energy storage as part of the analysis ▪ Recommendations will be made regarding specific resources that may be needed near the San Juan area (Palo Seco) to most cost-effectively compliment the resources being developed and deployed elsewhere in Puerto Rico. ▪ FEMA 404 hazard mitigation funding for replacing the units has been approved
All-Source Renewables and Energy Storage RFPs	▪ Supports compliance with renewable energy goals and Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan ▪ Includes generation equipment and energy storage facilities ▪ Provides information about the market price of the full range of possible renewable generation and energy storage technologies ▪ Establishes, pending system planning studies, how much renewable generation can be incorporated into the grid in the near-term (i.e., 1-3 years) ▪ Identifies further additions of renewable projects that can be integrated to the system in the mid-term (i.e., 4-7 years)
Synchronous Condenser Machines	▪ Provides some of the functions that the retired spinning generation used to provide for system stability but inverter-based generation (e.g., solar) cannot, such as short-circuit strength and system inertia ▪ Supports the integration of inverter-based generation systems such as photovoltaic solar panels without loss in stability
Hydroelectric Power Plants	▪ Currently undergoing a revitalization study to determine feasible concepts for restoring capacity and/or upgrading the facilities to contribute as part of the planned renewable portfolio of generation projects. ▪ Supports achievement of renewable energy goals and provides system flexibility and stability benefits ▪ Reduces reliance on imported fuel sources ▪ Provides essential backup power during major electricity outages or disruptions
Battery Energy Storage	▪ Provides frequency support (an important element of power quality on which customers rely) as solar and other renewable generation technologies are introduced ▪ Enables the utility to retire of some of its thermal generation by shifting loads (i.e., store generated energy during the day and dispatch it during other periods as needed) ▪ Supports compliance with renewable energy goals

Project	Enabling Factors
	▪ Provides the utility with operational experience with battery storage systems and supports transition to a 100% renewable generation
Mobile Emergency Generation	▪ Provides a safeguard for areas that are vulnerable to becoming disconnected from the grid when transmission infrastructure is damaged by extreme weather events, serving as generation sources in microgrids ▪ Provides backup and support to the integration of renewable generation systems during the early years of deployment and/or limited storage ▪ Provides emergency generation services for the safety and security of the island's residents during major outage events ▪ Supports transition period from fossil-based generation sources to a 100% renewable sources ▪ FEMA 404 hazard mitigation funding for the units has been approved
Black Start Systems	▪ Provides new black start power generation systems to provide plant power to each of the Costa Sur and Aguirre facilities so that the main thermal plants may be restarted without an external power feed ▪ Supports grid restoration efforts and alleviates grid constraints during blackout scenarios (e.g., hurricane-caused severe outages) ▪ Qualifies for FEMA 428 funding

Investment Strategy Highlights – Transmission, Substation, and Distribution Infrastructure

In 2019, PREPA, with support from Sargent & Lundy, prepared a 10-Year T&D Capital Expenditure (CapEx) Plan. This plan, which included thousands of T&D projects (ranging in size from very small to large), focused on replacing aging and damaged infrastructure, including grid modernization projects and taking other steps to improve the reliability and resilience of the utility's overall system. Subsequently in 2020, PREPA and Sargent & Lundy issued the T&D Roadmap which provided the planning, framework, and project development plans for the implementation of these capital investments. By mid-2020, PREPA and Sargent & Lundy synchronized the T&D Roadmap project types with the overall FEMA workplan previously developed by PREPA's Disaster Funding Management Office (DFMO). This included evaluating the projects for the applicability of funding sources (e.g., FEMA 428, 404, and/or 406) and expanding the work to encompass the complete vision of a modern telecommunication system. Table 3.4 summarizes major Transmission, Substation, and Distribution infrastructure projects within the 10-Year Infrastructure Plan.

Note that after commencement of the O&M agreement, LUMA will determine the investment strategy used to shape future updates to T&D projects in the 10-Year Plan.

Note: For ease of Plan review and manageability, in some cases we have consolidated smaller individual projects from the 3,500 originally articulated in the Sargent & Lundy

roadmap into a larger project in this plan. As the size and location of new renewable energy and energy storage resources are determined in the future, the timing, sequence, scope, and priority of certain projects and sub-projects may need to be adjusted.

Table 3.4 – Strategic Projects, Transmission, Substation, and Distribution Infrastructure

Project Summary	Asset Category Impacted		
	Transmission	Substation	Distribution
Restore the 38-kV sub-transmission lines that have been out of service since the 2017 hurricane season	X		
Rebuild and harden the T&D systems	X		X
Deploy distribution automation technology			X
Deploy fiber optic connectivity for a robust communication network	X	X	X
Rebuild and/or relocate existing distribution substations and transmission centers		X	
Add new transmission lines and substations to mitigate the risk of widespread system failure	X	X	
Alleviate thermal constraints on the transmission system through new hazard mitigation projects	X		
Modernize the existing central dispatch center in Monacillo, add a new backup central dispatch center in Ponce, and integrate emergency remote grid control centers at Daguao and Mayagüez	X	X	X
Acquire modern equipment to support the maintenance, repair, and installation of equipment and infrastructure	X	X	X
Coordinate necessary support for retired, new, or converted thermal generation and/or new renewable generation projects, as appropriate	X	X	X

Other Considerations

The approach and processes required to execute this 10-Year Infrastructure Plan are like those successfully used by other electric utilities.

However, given PREPA's current financial condition along with the 2017 hurricanes and the earthquake damage at Costa Sur in early 2020, budget and staffing constraints along with restoration priorities have severely limited the amount of engineering and construction that could be performed by PREPA in recent years. Therefore, as a part of this plan, additional external resources such as a program management team (PM), architectural and engineering (A&E) firms, and technical advisors (TA) will be required to supplement PREPA's resources and effectively execute and manage the massive volume of work and projects required to meet FEMA's, COR3's and PREPA's objectives as outlined in this plan. This is a common industry practice as many mainland electric utilities have used these kinds of external services to support large engineering and construction project workload. All PREPA's directorates, such as Operations, Maintenance, Engineering, Environmental, and Procurement, will benefit from working with these external professional organizations, which will be coordinated by PREPA's Project Management Office (PMO).

PREPA and P3A have advocated for contractors and the grid operator, LUMA, to open training facilities on the island. As part of the 10-Year Infrastructure Plan, it is essential for PREPA and LUMA to advocate for and support the implementation of local-training centers to educate staff for T&D and associated Generation work. Training programs like these, especially in the light of 10 plus years of planned work, can provide significant, sustained employment opportunities for the people of Puerto Rico, additional benefits to the economy, and support for our local communities. Additionally, enabling and strengthening increased use of local labor and expertise could help reduce capital investment program costs.

V. PRIORITIZED INFRASTRUCTURE PROJECTS

A. Introduction

This section of the 10-Year Infrastructure Plan categorizes each project in the plan as to priority. The three priority categories are near-term (2021-23 start), mid-term (2024-27 start), and long-term (2028 or later start).

We established a number of criteria and considerations to assign projects to categories. Project start, for the purposes of this prioritization, was defined as when 30% A/E design work is expected to commence. A/E work is the first standard milestone for projects in this infrastructure plan.

In this section, each priority category is accompanied by a description of the type of infrastructure projects contained within it, a summary overview of the number and estimated costs of projects in the priority category broken down by asset type, and an overview of the estimated timing for submission of projects to COR3 and FEMA. These overviews are then followed by a series of tables containing the name, brief description, estimated COR3 and FEMA submission timing, and class 5 cost estimate for each project in the priority category.

It is important to note that this infrastructure plan includes projects regardless of funding source, so although most projects include FEMA funding, some projects will be noted as being funded solely through PREPA's NME program. In addition, as the objective has been to identify a comprehensive set of infrastructure projects in this plan, some projects are included but do not yet have sufficient clarity on approach, cost, and timing to specify these elements in the plan. In these cases, the projects will be listed and described but may include "TBD" for project cost or timing elements. PREPA and LUMA expect to provide additional details on these projects in a future update to the plan.

Lastly, in accordance with direction from COR3 and FEMA, this plan will be updated every 90 days after the initial submission and will update project details and prioritization based on coordination with COR3 and FEMA, its own internal findings, and feedback from other stakeholders.

B. Asset Category Descriptions

The table below defines the asset categories contained in this plan and characterizes the types of projects found within each category:

Figure 4.1 – Asset Category Descriptions

GENERATION 	*Includes new renewable and potentially thermal power plant generation, grid support centers, thermal retirements, mobile emergency power generation, and plant improvements*
DAMS AND HYDRO 	*Includes dam safety and early warning systems, reservoirs, hydroelectric facilities, and irrigation canals*
TRANSMISSION 	*Includes transmission line restoration, hardening, and transmission reconfiguration*
DISTRIBUTION 	*Includes feeder, pole, transformer, and conductor replacements, intelligent device and distribution automation installation, and smart meter installation*
SUBSTATIONS 	*Includes distribution substations, transmission centers, and transmission/generation separation*
IT / TELECOM 	*Includes fiber optic and microwave systems, SCADA, VLAN, and two-way and wireless radio systems*
BUILDINGS 	*Includes flooded and severely damaged buildings as well as minor damages*
ENVIRONMENTAL 	*Includes demolition, soil stabilization, and restoration projects*

C. Project Prioritization Approach

Once projects were identified—as informed by the infrastructure investment strategy described above—PREPA prioritized projects in its portfolio based on the sequencing of projects required to support execution of its Governing Board's vision and the IRP, including PREB's guidance in response to the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan. Other overarching prioritization criteria were safety, impact to the community, relative complexity of the work, and regulatory requirements. In addition, projects were further prioritized within each asset category based on factors specific to each asset category. Some of these asset category-specific prioritization criteria are described below.

Transmission projects were prioritized based on the current status of the lines and if they are currently in or out of service; coordination with PREPA Operations to take into account system limitations and the feasibility of taking lines out of service to perform transmission line work, whether or not lines support critical loads; and the appropriate alignment and sequencing with other infrastructure projects including substations.

For Distribution projects, priorities were based on the identification of specific feeders deemed to be both critical and in immediate need of repair, feeders with critical customers, and projects required to support renewable integration and grid modernization.

Prioritization of Substation projects was based on numerous factors including significant storm damage, equipment at risk of failure, and need for relocation to prevent future flooding. Other prioritization factors considered include alignment of substation priorities with T&D priorities/cross-dependencies, support of grid constraint mitigation, and generation switchyard modernization needs.

IT/Telecom prioritization criteria included the need to repair existing systems required to support the grid, systems required to assess system damage, systems required to support new IT capabilities, and systems requiring additional engineering studies to solidify or refine project approach.

In addition, PREPA's Generation and Dams and Hydro projects were prioritized based on impact to the stable and reliable production of electricity for the island, the ability to recover from system events including improved black start capabilities, and the capabilities needed to support the integration of increased levels of renewable generation. Dams and Hydro project prioritization focused on safety of the impacted communities and the continued availability of water resources for human consumption and agriculture.

Building project prioritization was based primarily on importance of the facility and the need to relocate a facility to prevent future flooding damage. Environmental projects were

prioritized to create quick wins and to address immediate actions required to protect PREPA's assets.

Projects were assigned to one of the three priority categories described above based on these criteria and considerations.

D. Near-Term Category Overview

The near-term priority category is composed of projects that have either already begun 30% A/E design or are expected to do so in 2021-2023.

PREPA and LUMA intend to pursue a high proportion of their respective projects in the near-term for several reasons: 1) it is PREPA's and LUMA's objective to deliver results as quickly as possible, 2) some projects already have preliminary engineering and are ready to proceed into the 30% A/E design phase, and 3) some projects are very large in scope and must be initiated in the near-term to be completed within the later years of the plan.

In the sections that follow, we provide this information on near-term priority projects:

Table 4.1 – Provided Project Information

Section	Plan Information Provided
1. Description of projects	An overview of the projects in the priority category and the approach used to designate them, organized by asset type
2. Summary of projects	Number of projects by asset category and start year, along with total dollars by asset category
3. COR3 and FEMA submission timeline	Estimated timeline for submittal to indicate number of projects for each year and asset category
4. List of projects	Project name, a brief description, estimated submittal timing, estimated cost, and IRP reference section for each project included in the plan

1. Description of Near-Term Priority Projects

Generation and Dams and Hydro

Near-term Generation projects are focused largely on repair of damages incurred during the 2017 hurricanes and necessary maintenance at the generating facilities. This includes all

projects in the application submitted under the FEMA 428 program. Priority will be given to remediating safety issues.

Near-term projects will also focus on emergency power, including black start systems and emergency generating units that will be critical to restoring power after future natural disasters.

Aside from repairs at the existing generating facilities, near-term generation projects also include the construction of renewable generation and battery storage projects by third-party developers who will enter into power purchase and operating agreements with PREPA.

PREPA began administering a series of renewable energy and energy storage RFPs beginning in early 2021 and will continue to do so as articulated in this Plan for at least the next several years, but likely will continue for many years to come. New renewable energy projects and energy storage projects will be developed and owned by 3rd parties. PREPA will enter into Power Purchase and Operating Agreements (PPOAs) or Energy Storage Service Agreements (ESSAs) with the projects.

Synchronous condensers will be added to the system to provide the grid support required for a system with large amounts of inverter-based generation as much of the existing thermal generation is retired.

In addition, a new thermal generation feasibility study will be performed to conduct preliminary economic, siting, permitting, and planning analysis regarding a new thermal fired unit near the San Juan area (Palo Seco). This near-term planning also includes establishing a retirement sequence for aged fossil-fired generation equipment and all associated activities to facilitate the work (e.g., decommissioning, demolition, salvage, remediation, and restoration work). Per the PREB's March 26th Order, the feasibility study will include renewables and battery energy storage as part of the analysis. Areas that have been selected for the development of new facilities, or repurposing such as synchronous condensing services, are also planned in the near-term.

Near-term Dams and Hydro projects are focused on improving dam safety and reliability by repairing hurricane damage to hydro-electric plants, buildings, reservoirs, irrigation systems, penstocks, and other PREPA water assets.

Transmission

All the existing 115kV and 230kV Transmission Lines experienced hurricane-related disaster damage due to Hurricanes Irma and María. PREPA performed temporary emergency repairs on the hurricane-related disaster damaged structures for system restoration purposes. The near-term objective is to provide hardening/resiliency and/or rebuild the most critical 115kV and 230kV transmission lines and 38kV sub-transmission lines. In addition, LUMA is pursuing a project to repair and bring back into service a damaged section of the San Juan 115kV

Underground Transmission Loop, which is designed to provide a highly reliable power path around San Juan that is protected from severe weather.

The near-term A/E effort will determine the complete scope of work for each transmission line to determine the structure replacement plan and potential rebuild of the transmission line. It was assumed for the purposes of this plan that all wood structures and 20% of the concrete or steel poles would be replaced. The remaining transmission structures would be part of a hardening/resiliency program for each transmission line. For the resiliency improvements, PREPA will be replacing insulators; replacing or adding guy wires; repairing or replacing anchors, structure elements, and foundation; repairing or adding vibration dampers, drag dampers, and armored rods to conform to consensus-based codes.

Distribution

After the 2017 hurricanes, initial damage assessments were undertaken for 338 feeders to gather information on the number of damaged poles, transformers, and conductors. Based on this assessment, 150 feeders were identified as critical with an immediate need to repair. These feeders have been included in the near-term and classified in the first tier of projects to be completed.

The scope of the work primarily will be to rebuild the feeders to the current standards and to include distribution automation (DA) equipment. First each feeder will be hardened up to current codes and standards for all its backbone length, including feeders that have critical loads.

As part of the overall approach to distribution, LUMA will also introduce DA and reliability equipment onto the distribution system. PREPA considered intelligent reclosers, intelligent fuse cutouts, and replacement of underground switches. DA is part of a family of new electric utility technology solutions generally referred to as “Smart Grid” within the industry and has become an industry standard for leading utilities in the United States. DA significantly improves a utility’s reliability metrics, such as System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI); in other words, DA keeps customers’ power on as outages become less frequent and shorter in duration.

Substations

Substations are being evaluated for modernization, hardening, and relocation to meet new codes and standards to improve the resilience and reliability of the electric grid system throughout the island, including mitigation measures for previously flooded substations. These substations are categorized into four general groups: generation and switchyard modernization, flooded substation relocation, grid concerns, and modernization and hardening. Modernization will include the upgrade of existing protective relays to modern digital relays and replacement of existing oil circuit breakers with SF6 gas breakers. This will

improve system protection and eliminate some grid constraints. Hardening will include strengthening and/or replacement of existing control buildings/enclosures, structures, and components to better withstand a storm event and thereby improve grid reliability and resilience.

IT/Telecom

The telecommunication projects support the overall T&D and Generation programs. Telecommunications projects that must be undertaken immediately include fiber optics, land mobile, or 2-way, radio (LMR), microwave radio, infrastructure, DA, field area (radio) networks (FAN), advanced meter infrastructure (AMI), and communications network (IP/MPLS).

Fiber optics is the primary pathway to transport critical operational technology (OT) applications including protective relaying and supervisory control and data acquisition (SCADA), as well as information technology (IT) due to its bandwidth, latency, and data security. One of the first priorities is to largely replace the fiber optic backbone which suffered extensive storm damage and has insufficient capacity for a modern telecommunication system. This work must begin immediately due to the urgent, critical need and to leverage the opportunity to install new cable during planned, near-term T&D line work, thereby reducing costs. High fiber count, 96 fibers, optical ground wire (OPGW) will be used to replace the static, or ground, wire on transmission lines, while all-dielectric self-supporting (ADSS) cable will be installed on distribution lines.

Microwave radios suffered severe damage and are beyond their end-of-life, meaning they are no longer supported by their manufacturers. New standards-based, Internet Protocol (IP) radios must be deployed with greater bandwidth, reliability, and system gain. The new radios will contribute to a far more resilient, robust telecommunications transport network infrastructure.

Common, foundational communications infrastructure, such as radio towers, batteries, and communications generators and associated fuel tanks, suffered extensive damage and must be replaced. New radio towers will be designed to the newer, more stringent tower standards, so they will withstand higher wind speeds and provide greater resiliency to the threat from hurricanes and severe storms. This work must begin immediately as it is foundational to other critical telecommunications systems, including LMR, microwave radio, and FAN.

Replacement of the damaged end-of-life LMR system is a lengthy, complex project and is expected to take five years. Planning, including technology assessment, must begin immediately to ensure the right solution is developed and implemented for a survivable, resilient radio capability based on standards and industry best practices.

Similarly, the FAN represents a lengthy, complex project and is expected to take more than five years, possibly up to 10, to complete. The technology assessment, which must begin

immediately, will consider use of standards-based technologies and radio spectrum to support multiple requirements to the greatest extent possible. For example, if suitable sub-one gigahertz (<1 GHz) radio spectrum can be acquired, long-term evolution (LTE) infrastructure may be a viable, long-term, unified solution for serving DA, LMR, and AMI, as well as distributed energy resources (DER) and such technologies as smart streetlights.

Finally, in order to avoid duplication of costs and effort, the communications network must begin migration to the IP/MPLS standard immediately, as microwave radio and fiber optics transport assets are deployed. IP/MPLS is a proven, standards-based technology that has become the best practice in the U.S. utility industry and will effectively serve teleprotection, SCADA, and other critical applications with alternate routing, greater flexibility, and room for growth.

Buildings

Planned near-term projects related to buildings consist of repairs to approximately 14 buildings that were damaged by the 2017 hurricanes. These building repairs are important to facilities in use for ongoing operations and have been prioritized according to need and/or coordination with other related projects.

Environmental

Environmental permitting and remediation of near-term activities for the acquisition or divestiture of real property project categories include a Phase I and Phase II Environmental Site assessment.

Near-term activities will be required for projects that involve construction activities, construction-related soil disturbance, and potential impacts to environmental or cultural resources. These activities include definition of project and project-related construction activities and project area; a desktop review; the identification of potential environmental impacts and mitigation measures; and the development of a permitting/approval matrix.

Near-term activities for projects that include the installation or modification of new or existing generating resources include a compliance audit (if applicable); a desktop review; identification of applicable permits; and the preparation of a permit matrix and schedule.

Near-term activities for projects that include generating resource retirements and demolition activities include project-related construction activities, demolition activities, and project schedule to be clearly defined; soil sampling (if applicable); the identification of remediation requirements; the development of a waste management plan; and the preparation of permitting/approval matrix.

Information on each project in the near-term category can be found in Section 4. "List of Near-Term Priority Projects" below.

2. *Summary of Near-Term Priority Projects*

The following table summarizes the near-term project volume and aggregate cost by asset category:

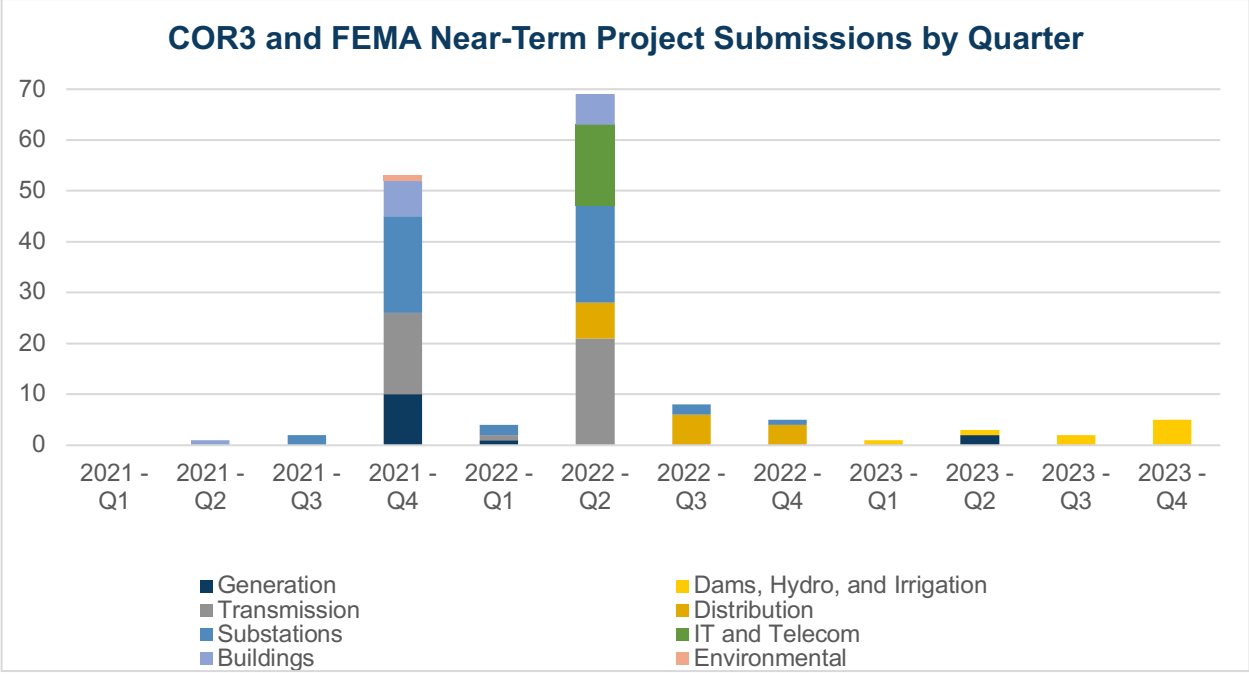
Table 4.2 – Summary of Near-Term Priority Projects

Asset Category	# of Projects Initiated			Total Projects	Total Cost Estimates (millions)
	2021	2022	2023		
Generation	24	5	2	31	$679
Dams, Hydro, and Irrigation	0	7	23	30	$1,287
Transmission	38	0	0	38	$1,622
Distribution	7	10	0	17	$1,538
Substations	39	6	0	53	$207
IT and Telecommunications	16	0	0	16	$675
Buildings	14	0	0	14	$10
Environmental	1	0	0	1	$15
Total	**139**	**28**	**25**	**200**	**$6,034**

3. *COR3 and FEMA Submission Timeline*

The following bar chart shows the estimated timeline for submittal of individual projects to COR3 and FEMA for review and approval:

Figure 4.2 – COR3 and FEMA Near-Term Project Submissions by Quarter



4. List of Near-Term Priority Projects

The tables below contain details on each of the individual projects in the near-term priority category.

Projects are grouped by asset category and contain project name, brief description, estimated timing for submission to COR3 and FEMA for review and approval (note that all projects will be submitted to the PREB prior to COR3 and FEMA), a class 5 cost estimate, and a reference to the section of PREB's Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan to which each project relates.

It is important to note that the cost estimate provided does not include potential hazard mitigation funding that may be available through FEMA's 406 Hazard Mitigation Program. PREPA intends to submit applications for 406 funding with each of its 428 projects, where applicable. These additional funds will be critical to reinforcing the new infrastructure to protect against damage from future disaster events.

All projects in the tables below are funded through FEMA's 428 program unless otherwise noted. Other funding sources included in this infrastructure plan include FEMA's 404 program and PREPA's NME. In addition, HUD's CDBG funds will support some of the infrastructure projects contained in this plan, but the allocation of the HUD funds has not yet been tied to specific projects, which will occur in a future update of this plan.

Generation – Near-Term (2021-2023)

Table 4.3 – Near-Term Generation Projects

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Emergency Generation - Yabucoa Units	This project includes the procurement and installation of two emergency generating units to be located at Yabucoa. These emergency generating units will use part of the remaining 81 MW of new gas-fired peaker generation allowed under the IRP Order.	2022 Q1	$45.50 Note: Funded through FEMA 404 program	Section III E
Mobile Emergency Generation - Remaining Peaking Capacity (contingent upon systems needs and PREB's review and approval)	This project includes the procurement of nine (9) mobile emergency generation units – each with an output of approximately 30 MW for a total of 270 MW – to replace the existing gas turbines and potentially be deployed as necessary around the island to strategic locations where power may be needed following an emergency, such as hurricanes and earthquakes. After Hurricane Maria, the Army Corps of Engineers (USACE) installed mobile generation units on the island to support emergency power generation to critical facilities until repairs could be made to damaged infrastructure. These mobile generating units were critical to restoring power but cost approximately $2M per unit per month to lease and operate. As FEMA has provided funding through its 404 Hazard Mitigation program for PREPA to secure emergency generation assets, they may not cover costs to lease emergency units should they be required in the future. PREPA will work with the PREB to determine the optimal locations for these mobile generating units as part of the Optimization Process. These mobile generating units will also support distributed generation alternatives, allowing them to be integrated in the new T&D grid as the system is transformed to make it more robust and resilient. This project will also include demolition of any existing gas turbine infrastructure approved for replacement with new mobile emergency generation units. In alignment with the March 26th PREB Order, PREPA will explore fulfilling this need with renewable energy resources and battery energy storage. This project is contingent upon systems needs and PREB's review and approval.	2023 Q2	$255.30 Note: Funded through FEMA 404 program	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Power Plants Units-Related Works and Repairs Projects (Necessary Maintenance - Next Three Fiscal Years)	This project is designed to provide required inspection, repairs, replacement, and maintenance at the following power plants: 1) Aguirre, 2) San Juan, 3) Palo Seco, 4) Costa Sur, 5) and the Aguirre combined cycle power plant. Project work includes site assessments of current systems and installed equipment, verification of code compliance, review of current drawings (mechanical, electrical, and instrument and controls), interview of plant operators to assess current systems and identify operationally-required maintenance work, and development of a plan for all required maintenance.	N/A	$157.50 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
New Black Start System at Costa Sur	The Costa Sur power plant with an output of 820 MW requires approximately 27 MW of black start capability. During Hurricane María, one of the two black start generators was grounded and the control room that operates both units was severely damaged by heavy rain fall and high winds making the black start system on both GTs inoperable. The objective of this project is to replace two outdated black start units, CT1.1 and CT 1.2, at the Costa Sur power plant with a new black start system that can provide reliable black start capabilities to the plant, inject power into the grid for voltage stability, or serve as an emergency generator when needed. This project will use part of the remaining 81 MW of new gas-fired peaker generation allowed under the IRP Order.	2023 Q2	$45.20	Section III C
Power Plants Other Repairs/ Replacement Projects (Necessary Maintenance - Next Three Fiscal Years)	This project is designed to provide required maintenance at the following power plants: 1) Cambalache, 2) Aguirre, 3) San Juan, 4) Palo Seco, 5) Costa Sur, and 6) the Aguirre combined cycle power plant. Project work includes site assessments of current systems and installed equipment, verification of code compliance, review of current drawings (mechanical, electrical, and instrument and controls), interview of plant operators to assess current systems and identify operationally-required maintenance work, and development of a plan for all required maintenance.	N/A	$44.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Power Plants Storage Tanks/Fuel Systems Projects (Necessary Maintenance -	Power plant unit-related maintenance is needed at the following power plants: 1) Cambalache power plant, 2) Aguirre power plant, 3) San Juan power plant, 4) Palo Seco power plant, and 5) Aguirre combined cycle power plant. Work includes site assessment of current systems and installed equipment, verification of code compliance, review of current drawings (mechanical, electrical, and instrument and controls), interview of operators to assess	N/A	$32.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Next Three Fiscal Years)	the current systems and identify operationally-required maintenance, development of preliminary design requirements, and review of requirements with PREPA for comment and approval.			
Aguirre Unit 1 Major Overhaul (Necessary Maintenance)	Perform maintenance overhaul of the steam turbine and boiler Unit #1 at the Aguirre power plant per original equipment manufacturer standards.	N/A	$18.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Power Plants Electrical/ Controls Projects (Necessary Maintenance - Next Three Fiscal Years)	Power plant electrical/controls maintenance projects are needed at the following power plants: 1) Cambalache power plant, 2) Aguirre power plant, 3) San Juan power plant, 4) Palo Seco power plant, and 5) Costa Sur power plant. Work includes site assessment of current systems and installed equipment, verification of code compliance, review of current drawings (mechanical, electrical, and instrument and controls), interview of operators to assess the current systems and identify operationally-required improvements, development of preliminary maintenance design, and review with PREPA for comment and approval.	N/A	$14.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Power Plants Water Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	Water system maintenance is needed at the following power plants: 1) Cambalache Water Systems, 2) Aguirre Water Systems, 3) San Juan Water Systems, and 4) Palo Seco Water Systems. Work includes site assessment of the current water protection system and installed equipment, verification of code compliance, determination if current water protection system meets plant requirements, review of current drawings (mechanical, electrical, and instrument and controls), interview of operators to assess the current water protection system and identify operationally-required maintenance.	N/A	$12.80 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Aguirre Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	The Aguirre power plant complex suffered extensive damage from Hurricane María. A site visit was conducted on August 9, 12, 22, and 26 of 2019 by a team of inspectors from FEMA and PREPA that included the steam plant, the combined cycle plant, and black start units. Most of the direct hurricane damage identified were in luminaries, buildings throughout the plant, the cooling tower, which was destroyed, structures such as roofs and siding, interior building damage caused by water and	2021 Q4	$9.20	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	miscellaneous equipment. The objective of this project is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work packages, execution timeline, sequence, and cost estimates to complete the needed Hurricane María repairs. The two black start gas turbines, which failed to operate during the hurricane, are separate projects under the FEMA settlement.			
Aguirre CC Main Power Transformer (Necessary Maintenance)	The power plant main power transformers at the Aguirre combined cycle plant have been operating for more than 45 years and have reached the end of their operating useful life. These main power transformers are to be maintained and replaced under this project.	N/A	$6.60 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Cambalache Power Plant Repairs (Damages from Hurricanes - Federal Funded)	The Cambalache power plant suffered extensive damage as a result of Hurricane María. A site visit to the plant was conducted on August 7, 2019, by a team of inspectors from FEMA and PREPA. Damages identified included site flooding due to damage to the flood dam structure around the plant, damages to various structures, equipment, roofs, siding, exterior and interior lights, interior building damages caused by high-speed winds, water, and flying debris. Many of these damages were repaired immediately after the storm to put the generating units back in service and avoid further deterioration. The objective of this project is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2021 Q4	$6.41	Section III C
New Thermal Generation Feasibility Study	This feasibility study will be conducted in alignment with the IRP Order and March 26th Order and will be focused on preliminary economic, siting, permitting, and planning analysis regarding a new fossil-fuel powered unit near the San Juan area (Palo Seco). The feasibility study will take into account responses to PREPA's renewable energy and energy storage RFPs; indicative pricing for combined-cycle, reciprocating engine, and combustion engine generators; siting and feasibility analysis for fueling infrastructure; opportunity cost to siting energy storage systems or renewable resources near the San Juan area (Palo Seco) as a result of fossil-fuel generation development near the San Juan area (Palo Seco); and recommendations regarding specific resources that may	N/A Feasibility Study Only	$5.00 Note: Funded through FEMA 404 program	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	be needed near the San Juan area (Palo Seco) in order to most cost-effectively compliment the resources being developed and deployed elsewhere in Puerto Rico.			
Palo Seco Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	The Palo Seco power plant suffered extensive damage as a result of Hurricane María. Two site visits were conducted on July 31, 2019, and August 1, 2019, by a team of inspectors from FEMA and PREPA. Most of the damages identified at the Palos Seco plant were flooding and water filtration due to excessive rain, damage to luminaries, structural elements, equipment, metal lagging and thermal insulation material blown away due to high winds and flying debris during the storm. Many of the damaged components were repaired immediately after the storm to put the generating plant back in service and to avoid further damages. The objective of this project is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2021 Q4	$5.00	Section III C
Jobos Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	The Jobos peaker power plant received damage from damaging high winds and flying debris during the storm. A site visit of the Jobos peaker power plant was conducted on September 12, 2019, by a team of inspectors from FEMA and PREPA. Most of the damages identified were roof blown away on offices and warehouses, interior acoustic ceiling damage, windows, diesel tank #1 and #2 secondary container liner, main facility fence, and miscellaneous plant control failure. Many of the hurricane-related damages were repaired immediately after the storm to avoid further damages. The objective of this project is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2021 Q4	$4.22	Section III C
Power Plants Fire Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	Fire protection system maintenance is needed at the following power plants: 1) Cambalache Fire Systems, 2) Aguirre Fire Systems, 3) San Juan Fire Systems, and 4) Palo Seco Fire Systems. Work includes site assessment of the current fire protection system and installed equipment, verification of code compliance, determination if current fire protection system meet plant	N/A	$4.20 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	requirements, review of current drawings (mechanical, electrical, and instrument and controls), interview of operators to assess the current fire protection system and identify operationally-required maintenance.			
Cambalache Dike (Damages from Hurricanes - Federal Funded)	During Hurricane María, the Cambalache flood protection barrier structure was damaged, eroded, and sediment accumulated around the dike due to the flood caused by the Arecibo River, which was 6 inches below the crest of the dike during the event. Also, the site is located within coastal flooding limit (1 mile). The objective of this project is to make improvements and reinforce the dike to withstand future flooding. But in order to reach an engineering solution, a civil structural study must be conducted by experts in this matter to determine the extent of the damage, conduct an evaluation, and provide recommended solutions.	2021 Q4	$4.00	Section III C
San Juan Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	PREPA's San Juan Power Plant received hurricane damage from high-speed damaging winds and flying debris. A site visit of the San Juan power plant was conducted on August 2, 2019, by a team of inspectors from PREPA. Many of the damages identified include warehouse roofs and siding, galvanized steel structures, boiler lagging and insulation on units 7, 8, 9, and10, overhead crane for main equipment units 9 and 10, battery charger's units 7 and 8, and other miscellaneous structures. Many of the damages were repaired following the storm to place the units back in service and to avoid further deterioration. The objective of this project is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2021 Q4	$3.83	Section III C
Mayagüez Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	Mayagüez Power Plant received hurricane damage from high-speed damaging winds and flying debris during the storm. A site visit was conducted on April 11, 2019, by inspectors from FEMA and PREPA. Damages identified include liner damaged during storm, the geomembrane was broken in various sections, faded peeled off paint, damage to the tank coating, RO contaminated water/membranes failed failure following the hurricane due to contaminated water, Units 1 and 2 transformer cooling fan failure, and miscellaneous corrugated metal sheets were blown away from equipment roofs during the storm. Many of the damaged power plant components	2021 Q4	$2.66	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	and structures were repaired to put the generating units back in service and avoid further deterioration.			
Daguao Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	PREPA's Daguao Power Plant received damage from high-speed damaging winds and flying debris during the storm. A site visit was conducted on August 23, 2019, by a team of inspectors from FEMA and PREPA. Damages identified include luminaries throughout the plant, damage to the fuel transfer pumps electrical system, fuel tank dike membrane liner, main power transformer dike interior, gas turbine air filters enclosures, access doors, stack paint, perimeter fence, building roofs, and other miscellaneous structures. Many of the damaged power plant components and structures were repaired to put the generating units back in service and avoid further deterioration.	2021 Q4	$1.96	Section III C
Yabucoa Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	Yabucoa Power Plant received damage from flooding, high-speed damaging winds and flying debris during the storm. A site visit was conducted on April 8, 2019, followed by a second visit on August 23, 2019, by inspectors from FEMA and PREPA. Damages identified include the diesel tank S2 concrete liner and paint, chain link fence concrete foundation, metal roof maintenance shops, air conditioners, and other miscellaneous structures. Many of the damaged power plant components and structures were repaired to put the generating units back in service and avoid further deterioration.	2021 Q4	$1.10	Section III C
Vega Baja Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	Vega Baja peaker plant received damage from high hurricane winds and flying debris during the storm. A site visit of the Vega Baja plant was conducted on August 30, 2019, by a team of inspectors from FEMA and PREPA. Damages identified include a blown away metal roof of a warehouse, destroyed light fixtures, a damaged A/C window unit, the emergency diesel engine cooling fan, the main facility entrance electric gate opening mechanism and miscellaneous structures. Many of the damaged power plant components and structures were repaired to put the generating units back in service and avoid further deterioration.	2021 Q4	$0.49	Section III C
Renewable Generation Projects - Tranche 1	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued August 24, 2020, the Puerto Rico Energy Bureau ordered PREPA to develop solar PV and battery storage	N/A	TBD $/kWh	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
(1,000MW of Generation Capacity / 500MW of Minimum Battery Storage Capacity)	resources in accordance with competitive procurement protocols. In addition, Act 82-2010 establishes RPS targets by year, which require significant additions of renewable generation and battery storage to the PREPA system in the near- and mid-terms. Tranche 1 of RFPs for these renewable and battery storage projects will include 1,000MW of renewable generation capacity and 500MW of minimum battery storage capacity. The exact location of each battery storage project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support. These projects and assets will be owned by 3rd parties who will enter into offtake agreements with PREPA.		(Based on Market Pricing)	
Renewable Generation Projects - Tranche 2 (500MW of Generation Capacity / 250MW of Minimum Battery Storage Capacity)	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued August 24, 2020, the Puerto Rico Energy Bureau ordered PREPA to develop solar PV and battery storage resources in accordance with competitive procurement protocols. In addition, Act 82-2010 establishes RPS targets by year, which require significant additions of renewable generation and battery storage to the PREPA system in the near- and mid-terms. Tranche 2 of RFPs for these renewable and battery storage projects will include 500MW of renewable generation capacity and 250MW of minimum battery storage capacity. The exact location of each battery storage project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support. These projects and assets will be owned by 3rd parties who will enter into offtake agreements with PREPA.	N/A	TBD $/kWh (Based on Market Pricing)	Section III E
Renewable Generation Projects - Tranche 3 (500MW of Generation Capacity / 250MW of Minimum Battery Storage Capacity)	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued August 24, 2020, the Puerto Rico Energy Bureau ordered PREPA to develop solar PV and battery storage resources in accordance with competitive procurement protocols. In addition, Act 82-2010 establishes RPS targets by year, which require significant additions of renewable generation and battery storage to the PREPA system in the near- and mid-terms. Tranche 3 of RFPs for these renewable and battery storage projects will include 500MW of renewable generation capacity and 250MW of minimum battery storage capacity. The exact location of each battery storage project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support. These projects	N/A	TBD $/kWh (Based on Market Pricing)	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	and assets will be owned by 3rd parties who will enter into offtake agreements with PREPA.			
Renewable Generation Projects - Tranche 4 (500MW of Generation Capacity / 250MW of Minimum Battery Storage Capacity)	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued August 24, 2020, the Puerto Rico Energy Bureau ordered PREPA to develop solar PV and battery storage resources in accordance with competitive procurement protocols. In addition, Act 82-2010 establishes RPS targets by year, which require significant additions of renewable generation and battery storage to the PREPA system in the near- and mid-terms. Tranche 4 of RFPs for these renewable and battery storage projects will include 500MW of renewable generation capacity and 250MW of minimum battery storage capacity. The exact location of each battery storage project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support. These projects and assets will be owned by 3rd parties who will enter into offtake agreements with PREPA.	N/A	TBD $/kWh (Based on Market Pricing)	Section III E
Renewable Generation Projects - Tranche 5 (500MW of Generation Capacity / 125MW of Minimum Battery Storage Capacity)	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued August 24, 2020, the Puerto Rico Energy Bureau ordered PREPA to develop solar PV and battery storage resources in accordance with competitive procurement protocols. In addition, Act 82-2010 establishes RPS targets by year, which require significant additions of renewable generation and battery storage to the PREPA system in the near- and mid-terms. Tranche 5 of RFPs for these renewable and battery storage projects will include 500MW of renewable generation capacity and 125MW of minimum battery storage capacity. The exact location of each battery storage project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support. These projects and assets will be owned by 3rd parties who will enter into offtake agreements with PREPA.	N/A	TBD $/kWh (Based on Market Pricing)	Section III E
Renewable Generation Projects - Tranche 6 (750MW of Generation Capacity / 125MW of	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued August 24, 2020, the Puerto Rico Energy Bureau ordered PREPA to develop solar PV and battery storage resources in accordance with competitive procurement protocols. In addition, Act 82-2010 establishes RPS targets by year, which require significant additions of renewable generation and battery storage to the PREPA	N/A	TBD $/kWh (Based on Market Pricing)	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Minimum Battery Storage Capacity)	system in the near- and mid-terms. Tranche 6 of RFPs for these renewable and battery storage projects will include 750MW of renewable generation capacity and 125MW of minimum battery storage capacity. The exact location of each battery storage project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support. These projects and assets will be owned by 3rd parties who will enter into offtake agreements with PREPA.			
"Shovel Ready" Project - Xzerta Tec Solar (≈ 60 MWs)	The Xzerta Tec Solar project is one of two shovel-ready renewable energy projects with agreements already approved by the FOMB. The Xzerta Tec Solar project is located on the north coast of the island and is approximately 60MW in size.	N/A	TBD $/kWh (Based on Market Pricing)	Section III E
"Shovel Ready" Project - CIRO One Salinas (≈ 90 MWs)	The CIRO One Salinas project is one of two shovel-ready renewable energy projects with agreements already approved by the FOMB. The CIRO One Salinas project is located on the south coast of the island and is approximately 90MW in size.	N/A	TBD $/kWh (Based on Market Pricing)	Section III E
Synchronous Condensers	Synchronous condensers will become necessary to provide different types of grid support as existing rotating generators are retired and non-rotating intermittent renewable generation is added. The Puerto Rico Energy Bureau2 calls for the conversion of several units to synchronous condensers in the future as PREPA's grid is modified post Hurricane María. Dynamic models are being updated and system studies are currently underway to determine the types of support the system will need as the newly approved solar PV projects are implemented, including inertia, short circuit strength, reactive power compensation, voltage stability, etc. PREPA island wide generators are being evaluated to identify potential units that could be converted and what it would take to convert them. In conjunction with the results from the system studies, this information will be used to determine which conversions are recommended and the timeline for each conversion. Preliminary studies indicate that two synchronous condenser projects will be required in the mid-term in order to ensure that enough	2024	$0.00 Note: Cost to be estimated in a future plan update	Section III C

[2]The Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued in July 2020

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	renewable generation can be added to the system at the pace required to achieve the renewable generation targets for the mid and long terms. • Synchronous condenser Unit 1 • Synchronous condenser Unit 2			

Dams and Hydro – Near-Term (2021-2023)

Table 4.4 – Near-Term Dams and Hydro Projects

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Guajataca Dam - Study/Assessment - Detailed Design - Procurement	The purpose of this project is to increase the Guajataca Dam spillway capacity, stabilize the earth embankment and abutment landslide while providing seismic resilience to the dam. With this project, the intent is to reduce the dam operational risks below the United States Army Corps of Engineers tolerable risk safety guidelines.	2024	$566.09	Section III C
Patillas Dam - Seismic Retrofit	The objective of this project is to strengthen the Patillas Dam's embankment to reduce the potential of a catastrophic failure due to liquefaction of embankment soils following a seismic event, thus protecting life and property of residents downstream of the dam.	2023 Q4	$558.00 Note: Funded through FEMA 404 program	Section III C
Early Warning System (Dams) Project	The purpose of this project is to install an island-wide early warning system (EWS) for thirty-seven (37) dams administered by PREPA. The instrumentation installed as part of the EWS will monitor the risk of dam rupture or damage, providing a warning signal to vulnerable areas downstream of the dam and first responders.	2023 Q3	$100.00 Note: Funded through FEMA 404 program	Section III C
Río Blanco Hydroelectric System Connection	This project consists of replacing damaged infrastructure from lateral erosion that led to abutment failure of a 70-foot aluminum truss bridge aerial pipe crossing. The erosion caused the bridge and 30-inch diameter fiberglass/concrete pipe to collapse, severing the gravity pipeline between the Cubuy and Sabana diversion dams that feed the Icacos Reservoir. A new 30-inch aerial pipe crossing is proposed for reconstruction with new pipe pedestal abutments and suspension bridge to support the new pipe crossing and span across the widened gully.	2024	$19.84	Section III C
Guajataca Reservoir	The objective of this project is to restore the Guajataca reservoir storage to a condition optimal for operations, water supply, and flood control after damage from Hurricane María. The Guajataca Reservoir is supplied by the Río Guajataca and Río Chiquito de Cibao and captured large quantities of sediment and debris from	2024	$18.99	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	heavy rains, surface water runoff carrying debris, soil erosion, and landslides.			
Toro Negro Hydroelectric System Connection between Splitter Box and Aceitunas Forebay	The Toro Negro Hydroelectric System Connection between the Splitter Box and Aceitunas Forebay was damaged primarily due to gully erosion, abutment scour, and/or debris transport. Damage led to the failure of a concrete bridge aerial pipe crossing, causing the bridge and pipe to collapse. Pipeline connections have both been temporarily restored but is not a long-term solution; pipelines and aerial crossing are not properly protected from future storm damage. This project would permanently restore the existing conveyance functionality.	2023 Q4	$10.18	Section III C
Toro Negro 1	The purpose of this project is to restore/repair the Toro Negro 1 hydropower plant from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage from water inside the power building covering the bottom floors affecting critical generation equipment. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2024	$2.47	Section III C
Main and Aguadilla Canal	The Main and Aguadilla Canal's damage was primarily caused from high winds, wind-driven rainfall, flash flooding (erosion), and fallen trees. Additionally, the breach of Guajataca Dam and subsequent canal operations caused cracking and scouring. This erosion of the side slopes and canal bottom led to canal failure. This project restores the existing canal functionality by repairing and replacing damaged concrete lining, which is cracked, displaced, and scouring below the surface of the lining, and damaged railings, fences, and gates.	2024	$2.01	Section III C
Juana Díaz Canal	The Juana Díaz Canal and adjacent areas were damaged from rushing waters and debris from an adjacent plantain farm, heavy rainfall, and landslides. This project repairs and replaces damaged items including the concrete canal lining, gabion baskets, and chain-link fence. This canal needs sediment removal from pipes and gravel fill for the road, which requires special consideration for extra drainage and landscape modifications to mitigate future damage.	2024	$1.96	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Toro Negro 2 Penstock	A 6,370-foot-long pipeline (transitioning from 36" to 30" to 24" hammer welded steel pipe) serves as the penstock conveying raw water from the El Guineo Reservoir to the Toro Negro 2 Hydroelectric Plant. Along an 817 linear foot segment of the 30" above-grade penstock, significant erosion or debris transport caused damage to two aerial pipe supports. One support has titled and is no longer supporting pipe. Severe erosion and leakage from a 3" hole in the pipe has exposed the foundation of a second support and is in danger of failure. Project objectives should upgrade and maintain a functioning penstock in a manner that would prevent similar damages during future storms.	2023 Q4	$1.74	Section III C
Caonillas 1	The purpose of this project is to restore/repair the Caonillas 1 Hydropower Plant from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage from water inside the power building affecting critical generation equipment. The two hydroelectric units remain out-of-service due to these damages. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2023 Q3	$1.65	Section III C
Patillas Canal	The Patillas Canal and adjacent areas were damaged from rushing waters with debris, heavy rainfall, embankment wash-out, and landslides. This project repairs right and left sidewalls and embankments with concrete and gravel fill material. Additional repairs include sinkhole, level measure ruler, access road, bridges, bridge access, gabion baskets, culvert, spillway, flume, and siphon.	2024	$1.05	Section III C
Guayabal Dam	The Guayabal Dam damage was primarily caused from high winds, wind-blown debris, landslides, floodwaters discharge, and surface flow erosion. This project will repair these damages including access roads, parking lots, fencing, building shell, repainting, crane structures, electrical components, erosion, flood gates, signs, and spillway to restore the dam back to pre-hurricane functionality.	2024	$0.78	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Patillas Dam	The Patillas Dam damage was primarily caused from high winds, heavy rainfall, wind-blown debris, and wave action during storm event. Repairs within this project's scope include concrete beams at the intake tower access bridge, building cracks, paint, windows, roofing, doors, communication system components, gate alarm system, power distribution components, lighting, stairs, railing, flooring, fencing, and slope stabilization.	2024	$0.47	Section III C
Moca Canal	The Moca Canal's damage was mainly caused by the breach of Guajataca Dam and subsequent canal operations caused cracking and scouring. This erosion of the side slopes and canal bottom lead to canal failure. Project scope includes repairing and replacing damaged concrete lining, which is cracked, displaced, and scouring below the surface of the lining. Also repair of other damaged components such as light fixtures, power lines, railings, fences, gates, pavements, and antennas to restore this area to pre-event functionality.	2024	$0.41	Section III C
Dos Bocas Dam	The Dos Bocas Dam damage was primarily caused from high winds, intense rainfall, landslides, and a crane structure collapse. Damages include communications systems, valves, dam foundation, electrical components, the hydraulic power unit and motor, reservoir monitoring system, crane structure, sedimentation of sluiceway, lights, fencing, drainage ditches, and tile drains.	2023 Q4	$0.38	Section III C
Dos Bocas 1, 2, 3	The purpose of this project is to restore/repair the Dos Bocas Hydroelectric Power Plant from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained equipment and building damage from heavy winds, wind driven rain, and flooding. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2024	$0.37	Section III C
Diversion Canal and Forebay	The Isabela Irrigation District is composed of the Guajataca Dam and the Diversion Irrigation Canal, the Moca Canal, the principal and Aguadilla Canals. The system bring water from the Guajataca Ward all the way to the Aguadilla Municipality. The most critical of this system is the diversion canal which is 10 miles long along the Guajataca Forrest. The canal is highly inaccessible and is prone to landslides and floating debris clogging the water flow. Due to its inaccessibility the cleaning and	2024	$0.28	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	unclogging work must be done manually. The system provides a water source for the Municipalities of Quebradillas, Isabela, San Sebastián, Moca, Aguadilla and Rincón. The time to put the Isabela Irrigation District back to operation after an event like María will be shorten by at least 3 weeks. Depending on the impact in the Moca, Principal and Aguadilla Canal the time of response could be from 2 to 3 days instead of weeks.			
Garzas Dam	The Garzas Dam damage was primarily caused from surface flow erosion, floodwaters, high winds, and fallen debris. On the exterior, a series of repairs will be needed damaged roads, electrical infrastructure, fences, and poles. The diversion tunnel was submerged and requires the replacement of electrical equipment, wiring, and conduit, as well as the mechanical equipment used for operation of the sluice gate. Additionally, railing repair and concrete repair in diversion tunnel and spillway tunnel are also required to restore the dam back to pre-hurricane functionality.	2023 Q1	$0.24	Section III C
Guerrero Reservoir	The objective of this project is to restore the Guerrero reservoir storage to a condition optimal for operations, water supply, and flood control after damage from Hurricane María. The Guerrero Reservoir is supplied by the Isabela Main Irrigation Canal and receives water from Guajataca Reservoir. This reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides.	2024	$0.19	Section III C
Toro Negro Hydroelectric System Connection (4)	Four raw water conveyance pipelines located throughout the Toro Negro Hydroelectric System were damaged by falling or transported debris, causing impact damage to multiple above-grade pipelines or pipeline components (including leaks from holes or cracks of undetermined size). Damage was observed at 12 segments, generally concentrated to three locations throughout the Toro Negro system; upstream of the Toro Negro Diversion Dam, downstream of the Matrullas Dam, and between the Toro Negro Splitter Box and Aceitunas Forebay. Project generally consists of pipeline point repairs to restore and maintain full conveyance capacity to damaged segments throughout the Toro Negro System.	2023 Q2	$0.11	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Río Blanco 1, 2	The purpose of this project is to restore/repair the Río Blanco Hydroelectric Power Plant from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage affecting critical generation equipment. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2023 Q4	$0.08	Section III C
Yauco 1	The purpose of this project is to restore/repair the Yauco Hydroelectric Power Plant No. 1 from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage from water/debris inside the power building affecting critical generation equipment. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2024	$0.06	Section III C
Matrullas Dam	The Matrullas Dam damage was primarily caused from high winds and wind-blown debris. Damages include fencing, flow measurement instrumentation, an access roadway, and signage. This project would restore access to the dam and improve public safety with the repair of fencing and signs.	2024	$0.06	Section III C
Guineo Dam	The Guineo Dam damage was primarily caused from increased wave action during the storm and impact of debris. The project scope entails removal and replacement of chain link fence surrounding the morning glory spillway and to remove and replace upstream and downstream sluice valves.	2024	$0.03	Section III C
Icacos Dam	The Icacos Dam damage was primarily caused from the impact of debris. Repairs within this project's scope include handrail replacement on catwalk bridge, in-kind removal and replacement of a steel plate door, and in-kind removal and replacement of a sluice valve operator.	2024	$0.01	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Río Blanco Penstock	The Río Blanco penstock has not been inspected due to safety reasons, therefore the extent of damages and repair scope in currently unknown. Conflicting information alludes to either pipe rehabilitation or replacement of the entire 3,677 LF of 32" penstock pipeline. A functioning penstock is the final conveyance pipeline in the Río Blanco system and is necessary as the direct connection to supply raw water to the 5 MW Río Blanco Hydroelectric Plant. The project objective should upgrade and maintain a functional penstock.	2024	TBD Note: Cost to be estimated in a future plan update	Section III C
Matrullas Building	The Matrullas Building's damage stemmed mostly from high winds, wind-driven rainfall, and flash flooding (erosion). The project consists primarily of trades-level repairs consisting of remove-dispose-replace fence, roof panels, paint, lights, windows, etc. A terrace/concrete barrier to mitigate further issues with erosion of the building's foundation material will require civil engineering. Roadway and building damage may require engineering efforts. The project objective is to restore the building in a manner to protect existing infrastructure and building foundation material.	2024	TBD Note: Cost to be estimated in a future plan update	Section III C
Prieto Reservoir	The objective of this project is to restore the Prieto reservoir storage to a condition optimal for operations, water supply, and flood control after damage from Hurricane María. The reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides.	2024	TBD Note: Cost to be estimated in a future plan update	Section III C
Yahucuas Reservoir	The objective of this project is to restore the Yahucuas reservoir storage to a condition optimal for operations, water supply, and flood control after damage from Hurricane María. The reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides.	2024	TBD Note: Cost to be estimated in a future plan update	Section III C

Transmission – Near-Term (2021-2023)

Table 4.5 – Near-Term Transmission Projects

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
36100 - Dos Bocas - Monacillos*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 36100 to consensus-based codes and standards and in alignment with IRP exhibit 2-11. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 49 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.	2021 Q4	$115.49	Section III C
Existing 38 kV - Line 3100 Monacillos TC to Daguao TC	The objective of this project is to repair and harden disaster-damaged 38kV line 3100 to consensus-based codes and standards, including replacement of temporary emergency repairs with permanent ones. Line 3100 is listed in IRP Exhibits 2-44 and 2-62 and provides service to the Rio Grande Estates substation, which is also prioritized for repair in the near term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 57.4 miles of transmission lines.	2022 Q2	$113.34	Section III C
Existing 38 kV - Line 2200 Dos Bocas HP to Dorado TC	The objective of this project is to repair and harden disaster-damaged 38kV line 2200 to consensus-based codes and standards and in alignment with IRP Exhibit 2-52, including repair of out-of-service segments and replacement of temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures	2022 Q2	$103.81	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	and components. This project includes work on approximately 52.6 miles of transmission lines.			
37100 - Costa Sur - Acacias*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 37100 to consensus-based codes and standards and in alignment with IRP exhibit 2-11. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 38 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening. This project is also critical to the integration and support of potential renewable generation projects in the area.	2021 Q4	$91.99	Section III C
Existing 38 kV - Line 3000 Monacillos TC to Jucos TC	The objective of this project is to repair and harden disaster-damaged 38kV line 3000 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 44.4 miles of transmission lines.	2022 Q2	$90.44	Section III C
36400 - Dos Bocas - Ponce*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 36400 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 36 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening.	2021 Q4	$87.44	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.			
Existing 38 kV - Line 100 and 200 Ponce TC to Jobos TC*	The objective of this project is to repair and harden disaster-damaged 38kV lines 100 and 200 to consensus-based codes and standards, including repair of out-of-service segments and replacement of temporary emergency repairs with permanent ones. Line 100 provides service to substation Salinas 4501, which is also prioritized for repair in the near term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 79.3 miles of transmission lines.	2021 Q4	$156.55	Section III C
5400 - Rio Blanco HP - Daguao TC*	The objective of this project is to repair and harden disaster-damaged 38kV line 5400 to consensus-based codes and standards, including replacement of temporary emergency repairs with permanent ones. Line 5400 is listed in IRP Exhibit 2-36 and provides power to Vieques and Culebra substations, which are also prioritized for repair in the near term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 37 miles of transmission lines. This project is also critical to the integration and support of potential renewable generation projects in the area.	2021 Q4	$73.06	Section III C
Existing 38 kV - Line 1500 Mayaguez GP to GOAB 1515	The objective of this project is to repair and harden disaster-damaged 38kV line 1500 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 29.7 miles of transmission lines.	2022 Q2	$58.61	Section III C
Existing 38 kV - Line 1200	The objective of this project is to repair and harden disaster-damaged 38kV line 1200 to consensus-based	2022 Q2	$55.37	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Mayaguez GP to Yauco 2 HP	codes and standards, including repair of out-of-service segments and replacement of temporary emergency repairs with permanent ones. Line 1200 is listed in IRP Exhibit 2-24 and provides service to substation Sabana Grande 6501, which is also prioritized for repair in the near-term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 28 miles of transmission lines.			
Existing 115 kV - Line 36800 Palmer Fajardo to Sabana Llana*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs, to address end-of-life line assets, and to harden existing 115kV transmission line 36800 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 31 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.	2021 Q4	$70.31	Section III C
Existing 38 kV - Line 1900 Dos Bocas HP to San Sebastian TC	The objective of this project is to repair and harden disaster-damaged 38kV line 1900 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 25.0 miles of transmission lines.	2022 Q2	$51.20	Section III C
50100 - Cambalache - Manati*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 230kV transmission line 50100 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate	2021 Q4	$43.47	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 20 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.			
36200 - Monacillos - Juncos*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 36200 to consensus-based codes and standards and in alignment with IRP exhibit 2-11. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 22 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.	2021 Q4	$42.74	Section III C
Existing 38 kV - Line 2700 Victoria TC to Quebradillas Sect	The objective of this project is to repair and harden disaster-damaged 38kV line 2700 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 20.3 miles of transmission lines.	2022 Q2	$41.27	Section III C
Existing 38 kV - Line 3600 Mnacillos TC to Martin Peña	The objective of this project is to repair and harden disaster-damaged 38kV line 3600 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration	2022 Q2	$39.98	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 19.6 miles of transmission lines.			
Existing 38 kV - Line 500 Ponce TC to Costa Sur SP	The objective of this project is to repair and harden disaster-damaged 38kV line 500 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 18.0 miles of transmission lines.	2022 Q2	$36.59	Section III C
37800 - Jobos - Caguas*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 37800 to consensus-based codes and standards and in alignment with IRP exhibit 2-11. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 27 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.	2021 Q4	$52.00	Section III C
Existing 38 kV - Line 2400 Dos Bocas HP to America Apparel	The objective of this project is to repair and harden disaster-damaged 38kV line 2400 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 12.8 miles of transmission lines.	2022 Q2	$26.86	Section III C
51300 - Ponce - Costa Sur*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 230kV transmission line 51300 to consensus-based codes and standards. Project	2021 Q4	$26.08	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 12 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.			
4100 - Guaraguo TC - Comerio TC*	The objective of this project is to repair and harden disaster-damaged 38kV line 4100 to consensus-based codes and standards, including repair of out-of-service segments and replacement of temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 12.8 miles of transmission lines.	2021 Q4	$25.28	Section III C
Existing 115 kV - Line 36200 Fajardo to Rio Blanco	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs, to address end-of-life line assets, and to harden existing 115kV transmission line 36200 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 18 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening	2022 Q1	$44.31	Section III C
37800 - Caguas - Monacillos*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line	2021 Q4	$33.40	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	37800 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 15 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.			
Existing 38 kV - Line 4000 Comerio HP to Escuela Francisco Morales	The objective of this project is to repair and harden disaster-damaged 38kV line 4000 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 10.6 miles of transmission lines.	2022 Q2	$22.33	Section III C
Existing 38 kV - Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	The objective of this project is to repair and harden disaster-damaged 38kV line 2800 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 10.9 miles of transmission lines.	2022 Q2	$22.21	Section III C
Existing 38 kV - Line 11400 Barceloneta TC to Florida TO	The objective of this project is to repair and harden disaster-damaged 38kV line 11400 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 6.6 miles of transmission lines.	2022 Q2	$13.81	Section III C
Existing 38 kV - Line 8900	The objective of this project is to repair and harden disaster-damaged 38kV line 8900 to consensus-based	2022 Q2	$11.51	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Monacillos TC to Adm. Tribunal Apelaciones	codes and standards, including replacement of temporary emergency repairs with permanent ones. Line 8900 provides service to the Centro Medico and Fonalledas substations, which are prioritized for repair in the near term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 5.8 miles of transmission lines.			
Existing 38 kV - Line 600 Caguas TC to Gautier Benitez Sect	The objective of this project is to repair and harden disaster-damaged 38kV line 600 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 4.8 miles of transmission lines.	2022 Q2	$10.11	Section III C
38000 - San Juan - Isla Grande (LOOP)*	The San Juan 115kV Underground Transmission Loop is designed to provide a highly reliable power path around San Juan that is protected from severe weather. The Loop consists of various underground segments that tie together the most significant transmission centers around San Juan, providing reliable power to the metropolitan area. The 115kV Line #38000 is a damaged portion of the Loop that needs to be returned to service. Also, in order to optimize operation of the loop, circuit breakers require repair or replacement at identified terminals, and protection and control (grid modernization) upgrades are required.	2021 Q4	$10.00	Section III E
39000 - Aguas Buenas - Caguas*	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs, to address end-of-life line assets, and to harden existing 115kV transmission line 39000 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 5 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-	2021 Q4	$9.70	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.			
8200 - San Juan SP - Catano Sect*	The objective of this project is to repair and harden disaster-damaged 38kV line 8200 to consensus-based codes and standards, including replacement of temporary emergency repairs with permanent ones. Line 8200 provides service to the Catano SECT substation, which is also prioritized for repair in the near term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 4.1 miles of transmission lines.	2021 Q4	$8.07	Section III C
Existing 38 kV - Line 9700 Palo Seco SP to Bay View Sect	The objective of this project is to repair and harden disaster-damaged 38kV line 9700 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 3.4 miles of transmission lines.	2022 Q2	$7.14	Section III C
9500 - Palo Seco SP - Cantano Sect*	The objective of this project is to repair and harden disaster-damaged 38kV line 9500 to consensus-based codes and standards, including replacement of temporary emergency repairs with permanent ones. Line 9500 is listed in IRP Exhibit 2-71 and provides service to the Catano SECT substation, which is prioritized for repair in the near term. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 3.4 miles of transmission lines.	2021 Q4	$6.71	Section III C
Existing 38 kV - Line 6700 Martin Peña TC to Villamar Sect	The objective of this project is to repair and harden disaster-damaged 38kV line 6700 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission	2022 Q2	$6.01	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	structures and components. This project includes work on approximately 3.0 miles of transmission lines.			
Existing 38 kV - Line 13300 Bayamon TC to Plaza del Sol	The objective of this project is to repair and harden disaster-damaged 38kV line 13300 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 2.7 miles of transmission lines.	2022 Q2	$5.39	Section III C
Existing 38 kV - Line 9100 Guaraguao TC to Bayamon Pueblo Sect	The objective of this project is to repair and harden disaster-damaged 38kV line 9100 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 2.4 miles of transmission lines.	2022 Q2	$5.05	Section III C
1100 - Garzas 1 HP - Garzas 2 HP*	The objective of this project is to repair and harden disaster-damaged 38kV line 1100 to consensus-based codes and standards, including repair of out-of-service segments and replacement of temporary emergency repairs with permanent ones. Line 1100 is a generation priority as it interconnects Hydro Power Plants Garzas 2 with the Grid. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 44 miles of transmission lines.	2021 Q4	$3.58	Section III C
Existing 38 kV - Line 11100 Canovanas TC to GOAB 11115	The objective of this project is to repair and harden disaster-damaged 38kV line 11100 to consensus-based codes and standards and replace temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 10.4 miles of transmission lines.	2022 Q2	$1.26	Section III C

Distribution – Near-Term (2021-2023)

Table 4.6 – Near-Term Distribution Projects

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project includes work on 43 distribution feeders for an estimated total of 251.55 miles.	2022 Q2	$520.42	Section III C
Distribution Feeders - Short Term Group 1 - Mayaguez Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the first set of distribution feeders to address in the short-term within the Mayaguez region. Overall, the group of short-term projects for Mayaguez include work on 32 distribution feeders for an estimated total of 216.76 miles. This project will be further defined in a future update of the plan.	2022 Q2	$138.73 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 2 - Mayaguez Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the second set of distribution feeders to address in the short-term within the Mayaguez region. Overall, the group of short-term projects for Mayaguez include work on 32 distribution feeders for an estimated total of 216.76 miles. This	2022 Q3	$138.73 Note: Cost will be refined based on final selection of feeders in this group	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	project will be further defined in a future update of the plan.			
Distribution Feeders - Short Term Group 3 - Mayaguez Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the third set of distribution feeders to address in the short-term within the Mayaguez region. Overall, the group of short-term projects for Mayaguez include work on 32 distribution feeders for an estimated total of 216.76 miles. This project will be further defined in a future update of the plan.	2022 Q4	$138.73 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 1 - Bayamon Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the first set of distribution feeders to address in the short-term within the Bayamon region. Overall, the group of short-term projects for Bayamon include work on 18 distribution feeders for an estimated total of 92.05 miles. This project will be further defined in a future update of the plan.	2022 Q2	$53.68 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 2 - Bayamon Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the second set of distribution feeders to address in the short-term within the Bayamon region. Overall, the group of short-term projects for Bayamon include work on 18 distribution	2022 Q3	$53.68 Note: Cost will be refined based on final selection of feeders in this group	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	feeders for an estimated total of 92.05 miles. This project will be further defined in a future update of the plan.			
Distribution Feeders - Short Term Group 3 - Bayamon Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the third set of distribution feeders to address in the short-term within the Bayamon region. Overall, the group of short-term projects for Bayamon include work on 18 distribution feeders for an estimated total of 92.05 miles. This project will be further defined in a future update of the plan.	2022 Q4	$53.68 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 1 - Carolina Region (Culebra 3801, Vieques Sub 2501 and Distribution)*	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the set of distribution feeders for Vieques and Culebra. Overall, the group of short-term projects for Carolina include work on 15 distribution feeders for an estimated total of 18.49 miles. This project will be further defined in a future update of the plan.	2021 Q4	$28.81	Section III C
Distribution Feeders - Short Term Group 2 - Carolina Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the second set of distribution feeders to address in the short-term within the Carolina region. Overall, the group of short-term projects for Carolina include work on 15 distribution	2022 Q3	$61.31 Note: Cost will be refined based on final selection of feeders in this group	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	feeders for an estimated total of 18.49 miles. This project will be further defined in a future update of the plan.			
Distribution Feeders - Short Term Group 3 - Carolina Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the third set of distribution feeders to address in the short-term within the Carolina region. Overall, the group of short-term projects for Carolina include work on 15 distribution feeders for an estimated total of 18.49 miles. This project will be further defined in a future update of the plan.	2022 Q4	$61.31 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 1 - Arecibo Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the first set of distribution feeders to address in the short-term within the Arecibo region. Overall, the group of short-term projects for Arecibo include work on 12 distribution feeders for an estimated total of 66.35 miles. This project will be further defined in a future update of the plan.	2022 Q2	$63.75 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 2 - Arecibo Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the second set of distribution feeders to address in the short-term within the Arecibo region. Overall, the group of short-term projects for Arecibo include work on 12 distribution	2022 Q3	$63.75 Note: Cost will be refined based on final selection of feeders in this group	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	feeders for an estimated total of 66.35 miles. This project will be further defined in a future update of the plan.			
Distribution Feeders - Short Term Group 1 - Ponce Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the first set of distribution feeders to address in the short-term within the Ponce region. Overall, the group of short-term projects for Ponce include work on 13 distribution feeders for an estimated total of 43.61 miles. This project will be further defined in a future update of the plan.	2022 Q2	$41.50 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 2 - Ponce Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the second set of distribution feeders to address in the short-term within the Ponce region. Overall, the group of short-term projects for Ponce include work on 13 distribution feeders for an estimated total of 43.61 miles. This project will be further defined in a future update of the plan.	2022 Q3	$41.50 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders - Short Term Group 1 - San Juan Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the first set of distribution feeders to address in the short-term within the San Juan region. Overall, the group of short-term projects for San Juan include work on 17 distribution feeders for	2022 Q2	$26.18 Note: Cost will be refined based on final selection of feeders in this group	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	an estimated total of 43.86 miles. This project will be further defined in a future update of the plan.			
Distribution Feeders - Short Term Group 2 - San Juan Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the second set of distribution feeders to address in the short-term within the San Juan region. Overall, the group of short-term projects for San Juan include work on 17 distribution feeders for an estimated total of 43.86 miles. This project will be further defined in a future update of the plan.	2022 Q3	$26.18 Note: Cost will be refined based on final selection of feeders in this group	Section III C
Distribution Feeders – Short Term Group 3 – San Juan Region	The objective of this project is to restore the distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities to critical customers such as hospitals, water/wastewater facilities, transportation hubs, and emergency response facilities, and preparing the system for a future distribution automation system. This project contains the third set of distribution feeders to address in the short-term within the San Juan region. Overall, the group of short-term projects for San Juan include work on 17 distribution feeders for an estimated total of 43.86 miles. This project will be further defined in a future update of the plan.	2022 Q4	$26.18 Note: Cost will be refined based on final selection of feeders in this group	Section III C

Substations – Near-Term (2021-2023)

Table 4.7 – Near-Term Substations Projects

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Fonalledas GIS Rebuilt 1401 1421	Fonalledas 38/13.2kV Substation is currently located in a floodplain. The objective is rebuilt this facility at the current site location, conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment damage and environmental concerns.	2021 Q3	$31.4	Section III C
Tapia GIS 1102 (Rebuilt)*	Tapia 38/4.16.2 kV substation is currently located in a floodplain and was flooded up to 3 feet by the nearby accumulation of water during heavy rain. The objective is rebuilt this facility at the existing site location on elevated platform/foundations, conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and mitigate safety hazards due to equipment damage and environmental concerns.	2021 Q4	$23.0	Section III C
Centro Médico 1 & 2 1327 & 1359*	Centro Médico 1 & 2 is a 38/4.16kV substation located at 18.3925, -66.0728. The two (2) 4.16-kV metal-clad switchgear enclosure structures are leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace the control house and the two (2) switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$11.8	Section III C
Santurce Planta (Sect) 1116	Santurce Planta (Sect) is a 38/4.16kV substation located at 18.45422, -66.076038. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace the control house and the switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q1	$11.4	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Cataño Modernization and Hardening*	This project will modernize and harden the Cataño substation and the associated distribution feeder circuits to meet the latest industry codes and standards to improve the reliability and resiliency of the grid and mitigate potential flood concerns. Replace existing equipment, including 38 kV breakers, 15 kV power distribution enclosure and 38/15kV step down transformer. Expand the 38 kV bays to accommodate 2 new transmission lines. Add a new drop in control enclosure. Raise equipment above flood level. Upgrade the protection and controls, including the remote ends. Reroute the entrance of the existing 38 kV sub transmission lines to connect to the new 38 kV bays. The objective of this project is to update substation equipment to PREPA and industry standards, improve system resiliency, and mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$11.0	Section III C
Victoria TC 7008	This transmission center was flooded as a result of Hurricane Maria. The flood mitigation scope includes installing a perimeter flood wall, stormwater collection basin and pump. The electrical scope is to replace equipment that is damaged, leaking and causing failures, or has reached its end of life (and for which spare parts are hard to find), and other related damaged equipment. This project is designed to bring this critical substation facility to PREPA and industry standards, improve system resiliency, and mitigate safety hazards due to equipment damage and environmental concerns.	2022 Q2	$8.50	Section III C
Guaynabo Pueblo	Guaynabo Pueblo is a 38/4.16/13.2 kV Substation currently located at 18.3648289, -66.113482. This facility substation switchgear (1901) with 5 feeders is out of service due to water damage, equipment failure, cracked foundations and burnt equipment. The second substation (1904) 2 recloser are attached to temporary and wood structure that are currently at risk to collapse. The control house is crowed with old and burnt equipment too small to accommodate any equipment upgrades. The objective is to bring this critical substation facility	2021 Q4	$7.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	up to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.			
Isla Grande 1101	This substation includes two 38kV OCB's (Oil Circuit Breakers) configuration that feed Line 5000 which goes to Miramar and Covadonga Sectionalizers (See picture attached). On the medium voltage side (4.16kV) it include a metal clad switchgear with (1) main breaker cubicle, (2) Service Transformer cubicles, (2) feeder positions cubicles (Feeder 1(1101-1, 02 & 1101-1, 1107-3 to Elliot J. Marti & Miramar Place) & Feeder 2 (1101-2 & 1107-4 Fez. Juncos, Miramar & Las Palmas). The objective is to conform this substation facility to PREPA and industry standards, improve resiliency, and mitigate safety hazards, and environmental concerns.	2022 Q2	$5.10	Section III C
Bayamon TC - BKRS Y1 - 1711 (Metalclad)*	Bayamón TC is a 115/13.2kV substation located at 18.399022, -66.141036. The 13.2-kV metal-clad switchgear enclosure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$5.30	Section III C
Berwind TC- MC - 1336	Berwind TC is a 115/38/13.2/4.16kV substation located at 18.41013, -66.01138. The 13.2-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q2	$4.00	Section III C
Cachete 1526 (Metalclad)*	Cachete is a 38/4.16kV substation located at 18.398077, -66.099033. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and	2021 Q4	$4.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.			
Caridad 1714 (Metalclad)*	Caridad is a 38/4.16kV substation located at 18.39836, -66.14126. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$4.00	Section III C
Condado - MC - 1133	Condado is a 38/4.16kV substation located at 18.45215, -66.06697. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q2	$4.00	Section III C
Crematorio - MC - 1512	Crematorio is a 38/4.16kV substation located at 18.42969, -66.08352. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q2	$4.00	Section III C
Egozcue - MC - 1109	Egozcue is a 38/4.16kV substation located at 18.440870, -66.068687. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q2	$4.00	Section III C
Esc. Industrial M. Such - MC - 1423	Esc. Industrial M. Such is a 38/4.16kV substation located at 18.410550, -66.043396. The 4.16-kV metal clad switchgear enclosure structure is	2022 Q2	$4.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.			
Llorrens Torres 1106 (Metalclad)*	Llorens Torres is a 38/4.16kV substation located at 18.44647, -66.04438. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$4.00	Section III C
Parques y Recreos - MC - 1002	Parques y Recreos is a 38/4.16kV substation located at 18.46208, -66.09013. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and mitigate safety hazards due to equipment age or environmental concerns. In addition to the switchgear, the transformer oil containment, fence, equipment cabinets, and yard safety gravel will be replaced.	2022 Q2	$4.00	Section III C
Puerto Nuevo - MC - 1520	Puerto Nuevo is a 38/4.16kV substation located at 18.416170, -66.079538. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q2	$4.00	Section III C
Taft 1105 (Metalclad)*	Taft is a 38/4.16kV substation located at 18.45091, -66.06074. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency,	2021 Q4	$4.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	and to mitigate safety hazards due to equipment age or environmental concerns.			
Viaducto TC 1100 (Metalclad)*	Viaducto TC is a 115/38/13.2/4.16kV substation located at 18.44655, -66.07787. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$4.00	Section III C
Baldrich - MC - 1422	Baldrich is a 38/4.16kV substation located at 18.41243, -66.05708. The 4.16-kV metal-clad switchgear enclosure structure is leaking and causing failures, end of life has been reached and spare parts are hard to find. The objective is to replace this switchgear to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2022 Q2	$3.98	Section III C
Isla Grande GIS	The substation shows evidence of flooding inside the GIS building where major equipment and Protection/Control/SCADA are located. The roof appears to have significant damage and is causing water egress throughout the building. Additionally, the substation shows significant amount of debris and tripping hazards in and outside the building. The objective is to remove debris, paint the structure, repair and replace damaged equipment – such as battery banks, flooring, roofing, luminaries, motorized doors – to conform this critical asset substation facility to PREPA and industry standards. This project will improve system resiliency and help mitigate safety hazards due to equipment failure, age, or environmental concerns.	2022 Q1	$3.50	Section III C
Rio Grande Estates 2306 (Elevated Control House)*	Perimeter fence, retaining wall, ground grid and other equipment on the yard are also damage. The 38-kV Line wood pole just outside the fenced area also sustained damage during the storm. The objective is to replace damaged control house, transmission line pole, and other related damaged equipment and to conform this	2021 Q4	$3.50	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment damage and environmental concerns.			
Tallaboa 5402	This substation was flooded following Hurricane Maria. As part of the scope the substation will be rebuilt at a higher elevation. The perimeter fence, retaining wall, ground grid and other equipment on the yard are damaged. The objective is to replace damaged control house and other related damaged equipment and to conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment damage and environmental concerns. Equipment that has reached its standard useful life, is leaking, or causing failures, will be replaced.	2022 Q2	$2.50	Section III C
Conquistador - CH	The Conquistador substation is a 115kV/13.2kV station that requires a new control house due to the condition of the current control house. The new control house will be designed to meet industry-based codes and standards and will be fully digital, with fiber optic cabling that will be resilient during future storm events.	2022 Q2	$2.50	Section III C
Aguirre BKRS T018*	Aguirre TC is a 230/115-kV substation and the 230-kV yard consists of a five-bay, breaker-and-a-half arrangement. Four (4) existing 230-kV oil-circuit breakers are now beyond their useful recommend service life and are obsolete. Spare parts are difficult to locate and the ability for these breakers to meet the required electrical and short circuit ratings is unknown. Retaining the oil-filled breakers further poses environmental concerns and mitigation is necessary. The objective is to replace the end-of-life, oil-filled breakers with new SF6 circuit breakers to conform this facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$2.30	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Costa Sur BKRS P001*	Costa Sur is a 230/115/38-kV substation and the 230-kV yard consists of a five-bay, breaker-and-a-half arrangement. Four (4) existing 230-kV oil-circuit breakers are now beyond their useful recommend service life and are obsolete. Spare parts are difficult to locate and the ability for these breakers to meet the required electrical and short circuit ratings is unknown. Retaining the oil-filled breakers further poses environmental concerns and mitigation is necessary. The objective is to replace the end-of-life, oil-filled breakers with new SF6 circuit breakers to conform this facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$3.70	Section III C
Vieques SUB 2501*	The island of Vieques has a main electrical substation of 7.5 MVA served off a 38 kV electrical line (TL 5400). This substation steps down the 38 kV to 4.16 kV and serves 3 feeders that supplies the island. High winds and debris damaged multiple disconnect switches, fittings, structures, and circuit breakers. Failed control house waterproofing allowed water ingress damaging control equipment. Perimeter fence and station ground grid are destroyed representing an electrical safety hazard. All electrical distribution equipment to be replaced shall be specified to support increased capability for future renewable power integration. The objective is to conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment failure, age, or environmental concerns.	2021 Q4	$2.30	Section III C
Caparra 1911 & 1924	The perimeter fence, retaining wall, ground grid and other equipment on the yard are damaged. The objective is to replace damaged control house and other related damaged equipment and to conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment damage and	2022 Q2	$1.50	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	environmental concerns. Equipment that has reached its standard useful life, is leaking, or causing failures, will be replaced.			
Canas TC BKRS 115kV	Canas TC is a 115/38-kV substation and the 115-kV yard consists of a six-position ring bus. Three (3) existing 115-kV oil-circuit breakers are now beyond their useful recommend service life and are obsolete. Spare parts are difficult to locate and the ability for these breakers to meet the required electrical and short circuit ratings is unknown. Retaining the oil-filled breakers further poses environmental concerns and mitigation is necessary. The objective is to replace the end-of-life, oil-filled breakers with new SF6 circuit breakers to conform this facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$1.40	Section III C
Covadonga GIS Minor Rprs - 1011	Covadonga GIS is a 38/13.2/4.16kV substation located at 18.465536, -66.107085. Minor equipment and materials at the station were damaged during the 2017 storm. The objective is to clean, repair, restore and replace minor items such as control building's paint, flooring, roofing, luminaires, motorized door, and perimeter fence paint to mitigate safety hazards and environmental concerns.	2021 Q4	$1.40	Section III C
Culebra 3801*	The island of Culebra has a main electrical substation of 3.2 MVA served off the 38 kV electrical line (TL 5400). This substation steps down the 38 kV to 4.16 kV and serves 2 feeders that supplies the island. Failed control house waterproofing allowed water ingress damaging control equipment. Perimeter fence and station ground grid are destroyed representing an electrical safety hazard. The objective is to conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment failure, age, or environmental concerns. All electrical distribution equipment to be replaced shall be specified to support increased capability for future renewable power integration.	2021 Q4	$1.20	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Salinas Urbano Minor Rprs - 4501	The objective is to clean, repair, restore and replace minor items such as transformer oil containment, perimeter concrete wall, warehouse door, control room door and paint, insulator, substation poles, and substation luminaires to mitigate safety hazards and environmental concerns. Equipment that has reached its standard useful life, is leaking, or causing failures, will be replaced.	2022 Q2	$1.00	Section III C
Caguas TC BKRS 115kV	Caguas TC is a 115/38-kV substation and the 115-kV yard consists of a five-position ring bus. Two (2) existing 115-kV oil-circuit breakers are now beyond their useful recommend service life and are obsolete. Spare parts are difficult to locate and the ability for these breakers to meet the required electrical and short circuit ratings is unknown. Retaining the oil-filled breakers further poses environmental concerns and mitigation is necessary. The objective is to replace the end-of-life, oil-filled breakers with new SF6 circuit breakers to conform this facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q3	$0.94	Section III C
Monacillo TC - Breakers	The Monacillos TC will require the replacement of three breakers associated with the near-term transmission line hardening projects terminating at the station. As part of the BBA methodology, the codes & standards hardening for the transmission lines damaged during Hurricane Maria includes the breakers terminating at the associated stations. The three breakers associated with the 36100, 36200, and 37800 transmission lines will be replaced with new 115kV SF6 gas breakers.	2022 Q2	$0.80	Section III C
Jayuya Minor Rprs - 8301	The objective is to clean, repair, restore and replace minor items such as yard safety gravel, transformer oil containment, 115kV wood structure, fence, control room window & cable and substation luminaires to mitigate safety hazards and environmental concerns. Equipment that has reached its standard useful life, is leaking, or causing failures, will be replaced.	2022 Q2	$0.70	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
MANATI TC BKR - T005*	Manatí TC is a 230/115/38-kV substation and the 230-kV yard consists of a four-position ring bus. One (1) existing 230-kV oil-circuit breaker is now beyond useful recommend service life and is obsolete. Spare parts are difficult to locate and the ability for this breaker to meet the required electrical and short circuit ratings is unknown. Retaining the oil-filled breaker further poses environmental concerns and mitigation is necessary. The objective is to replace the end-of-life, oil-filled breaker with a new SF6 circuit breaker to conform this facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment age or environmental concerns.	2021 Q4	$0.67	Section III C
Coamo PDS Minor Rprs - 4603	Coamo PDS is a 38/13.2kV substation located at 18.067291, -66.368349. Minor equipment and materials at the station were damaged during the 2017 storm. The objective is to clean, repair, restore and replace minor items such as transformer oil containment, fence, equipment cabinets and yard safety gravel to mitigate safety hazards and environmental concerns. Equipment that has reached its standard useful life, is leaking, or causing failures, will be replaced.	2021 Q4	$0.50	Section III C
Sabana Grande Minor Rprs - 6501	The objective is to clean, repair, restore and replace minor items such as transformer oil containment, fence, and substation luminaires to mitigate safety hazards and environmental concerns. Equipment that has reached its standard useful life, is leaking, or causing failures, will be replaced.	2022 Q2	$0.30	Section III C
Substation Minor Repairs - San Juan Region	The objective is to clean, repair, restore and/or replace minor items that are beyond their industry standard useful life within substations and bring substations to industry standards, mitigating safety hazards and environmental concerns.	2022 Q1	$2.55	Section III C
Substation Minor Repairs - Arecibo Regions	The objective is to clean, repair, restore and/or replace minor items that are beyond their industry standard useful life within substations and bring substations to industry standards,	2022 Q2	TBD Note: Cost to be	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	mitigating safety hazards and environmental concerns.		estimated in a future plan update	
Substation Minor Repairs - Bayamon Region	The objective is to clean, repair, restore and/or replace minor items that are beyond their industry standard useful life within substations and bring substations to industry standards, mitigating safety hazards and environmental concerns.	2022 Q3	TBD Note: Cost to be estimated in a future plan update	Section III C
Substation Minor Repairs - Mayaguez Region	The objective is to clean, repair, restore and/or replace minor items that are beyond their industry standard useful life within substations and bring substations to industry standards, mitigating safety hazards and environmental concerns.	2022 Q3	TBD Note: Cost to be estimated in a future plan update	Section III C
Substation Minor Repairs - Ponce Region	The objective is to clean, repair, restore and/or replace minor items that are beyond their industry standard useful life within substations and bring substations to industry standards, mitigating safety hazards and environmental concerns.	2022 Q4	TBD Note: Cost to be estimated in a future plan update	Section III C
Arecibo Pueblo 8002 Relocation	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	TBD Note: Timing to be estimated in a future plan update	TBD Note: Cost to be estimated in a future plan update	Section III C
Bayview Sectionalizer 1802 Relocation	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	TBD Note: Timing to be estimated in a future plan update	TBD Note: Cost to be estimated in a future plan update	Section III C
Charco Hondo 8008 Relocation	The objective of this project is to address flooding issues at this substation, harden	TBD	TBD	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	Note: Timing to be estimated in a future plan update	Note: Cost to be estimated in a future plan update	
Pampanos Relocation	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	TBD Note: Timing to be estimated in a future plan update	TBD Note: Cost to be estimated in a future plan update	Section III C
San Jose Relocation	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	TBD Note: Timing to be estimated in a future plan update	TBD Note: Cost to be estimated in a future plan update	Section III C
Acacias 6801 TC Relocation (Trans and Distribution Sub)	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	TBD Note: Timing to be estimated in a future plan update	TBD Note: Cost to be estimated in a future plan update	Section III C
Cambalache TC Relocation	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	TBD Note: Timing to be estimated in a future plan update	TBD Note: Cost to be estimated in a future plan update	Section III C
Dorado TC Relocation	The objective of this project is to address flooding issues at this substation, harden substation components and systems, design equipment to consensus-based codes and	TBD Note: Timing to be estimated in	TBD Note: Cost to be estimated in	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	standards, increase reliability of service to customers, and improve safety to personnel and public. This project is to be further defined in a future plan update.	a future plan update	a future plan update	

IT / Telecom – Near-Term (2021-2023)

Table 4.8 – Near-Term IT/Telecom Projects

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
MPLS Network Deployment	PREPA has 349 network sites that form its current telecommunications transport network. In total, between substations, microwave sites, and data center locations, the communication network will eventually extend to approximately 400 sites. This Operations Technology (OT) network, communicating over a combination of fiber and wireless, allows for remote monitoring, control, protection, and engineering access to the electric grid. As part of the rebuilding effort, PREPA will have new fiber cables installed, wireless infrastructure built out, and a Dense Wavelength Division Multiplexing (DWDM) and Internet Protocol (IP) / multiprotocol label switching (MPLS) network created to connect its substation, generation, and office facilities. A robust communication network is the cornerstone to safe and reliable operation, maintenance, and recovery of the electric grid. During both normal and storm conditions, communication networks allow operators and engineers insight into the state of the grid, providing the key information that will drive and guide any response. As has been shown in utilities across the world, a communication system built around an IP/MPLS network provides the scalability, reliability, and adaptability required for SCADA, Distribution Automation (DA), engineering access, Field Area Network (FAN) backhaul, advanced metering infrastructure (AMI) backhaul, distributed energy resource (DER) control, Security systems connectivity, and other services.	2022 Q2	$150.92	Section III E
FAN	PREPA's existing field area network is used to support various substation communications requirements including supervisory control and data acquisition (SCADA) remote terminal units (RTUs), remote revenue/billing metering, and telephone. The two systems historically used by PREPA for the Field Area Networks, to extend beyond the traditional network boundary at the substation, are the legacy narrowband GE iNET and RAD Airmux point-to-point (PTP) platforms. Virtually all Airmux radios were damaged in the hurricanes and require replacement, while approximately 70% of the total iNET devices suffered severe damage and must be replaced. The legacy iNET radio platform	2022 Q2	$93.60 Note: Funded through 428 and PREPA NME	Section III E

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	has reached end-of-life and has limited availability of spares and support. Additionally, the technology's performance, in terms of data rate and latency, is unable to support the density and aggregate number of field devices and connectivity demands of PREPA's future hardened electric distribution grid and systems. Due to the increased density of devices in a modern power grid, only a broadband solution will effectively serve those needs at an economic price point. PREPA's next-generation distribution grid will rely on a foundational wireless field area network that provides connectivity and services to every grid asset requiring communications. This wireless network must meet the utility requirements for reliability and resiliency of a connected grid, must adhere to the stringent safety standards required for power delivery, be standards based, vendor agnostic, and capable of supporting the density of devices required for all current and future applications.			
Cybersecurity Program Implementa-tion	Support of PREPA's modernized OT systems, such as the EMS and ADMS systems, requires developing and implementing a modern cybersecurity program to achieve cyber resiliency for PREPA's most critical infrastructure. This includes PREPA's substations, Field Area Network (FAN), Control Centers, and all other facilities and devices utilizing PREPA's telecommunication system. This project will implement a risk-centric program, to be integrated with PREPA's existing cybersecurity network architecture, by setting realistic implementation goals based on assessed cyber threats and risks. The cybersecurity project will enhance cyber resiliency (including increased detection and responding to/recovery from cyber events) by providing security controls such as intrusion detection technologies, malware protections, gateway and endpoints, file integrity checking software, and encryption, to prevent security damage or unplanned disruption to operations resulting in system downtime. The project will, therefore, both enable and protect the modernized OT systems through the implementation of an evolving cybersecurity program based on business and technology risk and readiness factors.	2022 Q2	$74.30 Note: Funded through 428 and PREPA NME	Section III E
Advanced Distribution Management System	An Advanced Distribution Management System (ADMS) is the combination of a Distribution Management System (DMS, D-SCADA) with an Outage Management System (OMS). Parts of the PREPA grid were damaged and	2022 Q2	$48.02	Section III E

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
(ADMS) (OT/ Backoffice)	restoration efforts created inconsistencies in system data and modeling. This project will define requirements and capabilities, modernizing PREPA's existing OMS by implementing a new ADMS, preparation of the data needed for movement into the ADMS system, building interfaces to new replacement OT PREPA systems, and training of operators in its use. The modern systems that will be installed as part of this program will also need to interface with inputs from the new AMI system planned for deployment. Putting in an ADMS system, and populating the OMS portion first, provides PREPA a modern OMS and the ability to update meter location information, and transformer to meter relationships, as the AMI system is deployed, making system information readily available and immediately useful. This new system will help aid in a reduction in SAIDI and CAIDI scoring.			
GIS System	The geospatial information system (GIS) is the central operational technology system in a utility. Updating the accuracy of PREPA's GIS information is vital to the foundation of the IT/OT systems that import data to, and export data from the GIS system. PREPA's current GIS platform cannot meet the needs of the incoming data from replaced and reconfigured infrastructure. PREPA's existing GIS will be updated to provide accurate asset locations, model and simulation storage, asset information, planning information and models, outage location in geographic terms, vehicle routing, and many other services for management of new infrastructure. In the near-term, an updated GIS platform will provide efficiencies in the execution of projects while providing the long-term benefit of operation support and planning of future projects.	2022 Q2	$48.02	Section III C
Monacillo Control Center	The objective of this project is to modernize and harden the Monacillo control dispatch center to new industry standards and codes to enhance system operations, realize improvements in reliability, and expand situational awareness of the Puerto Rico electric grid. Hardening of the building will include the new increased wind requirements in accordance with the 2018 Puerto Rico Building Code (PRBC). An underground fiber backbone will be run between the Monacillo and Ponce Control centers.	2022 Q2	$41.16	Section III C

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Ponce Control Center	The objective of this project is to install a new Ponce control dispatch center to new industry standards and codes to improve reliability and situational awareness of the Puerto Rico electric grid, and to serve as a backup to the Monacillo control dispatch center. The new building will be constructed to meet the new wind requirements in accordance with the 2018 Puerto Rico Building Code (PRBC). An underground fiber backbone will be run between the Monacillo and Ponce Control centers.	2022 Q2	$41.16	Section III E
Energy Management System (EMS) (OT/ Backoffice)	The EMS (energy management system) monitors and controls the distribution of power across the power transmission system (e.g., transmission lines, substations, reclosers, sensors, RTUs, etc.), providing operators visibility into the flow of energy by helping to spot potential troubles or respond efficiently to outages. This makes the EMS one of the most urgent and crucial elements in keeping the lights on and improving resilience of any kind. This project will modernize PREPA's existing EMS to maintain system reliability and allows for implementation of a new EMS system. The new EMS will be industry standards driven, and capable of interfacing with other replaced systems such that all Backoffice systems, including the EMS, form a cohesive and holistic IT/OT architecture for PREPA's operations. This approach centers on the immediate benefits of reliable power supply, while laying the foundation for much more robust system architecture to withstand a wider range of outages and better fault location.	2022 Q2	$39.30 Note: Funded through 428 and PREPA NME	Section III C
LMR Two-way radio P-25	The PREPA two-way voice radio system also known as the Land Mobile Radio system (LMR) suffered severe damage from Hurricane María. The current two-way system consists of EDACS and MotoTrbo Radio equipment which are incompatible with each other. The existing LMR system incurred significant damage and must be replaced to restore LMR services to its previous full and reliable operational status. Given the existing PREPA LMR technology is obsolete, unrepairable, and incompatible with any modern replacement LMR systems, it will need to be completely replaced with a modern Trunked LMR system. Implementing a modern system will provide additional crew safety with the availability of a dedicated button to initiate an emergency alert notification and the availability of an automatically activated man down emergency notification alert. Optionally, implementing a P-25 standard based LMR	2022 Q2	$34.30	Section III E

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	system would also allow the interoperability with other P-25 LMR systems operated by public safety and other governmental agencies throughout Puerto Rico.			
Physical Security Assessment for Facilities	In order to modernize damaged camera and badge reader systems, this project includes a detailed assessment that will provide security profiles of each facility, as a simple like-for-like replacement may not be up to industry standards. The collected data and information will be used to create a risk profile that will provide guidance on required Electronic Security systems, processes, and procedures for each type of facility. This project will secure current facilities and provide a roadmap for the deployment and timing of the projects to update those facilities; develop standards, processes, and specifications for execution by EPC or other means; group substations into tiers to facilitate electronic security budgeting and deployment; and provide Electronic Security system designs and installation at Facilities. This project aligns PREPA facilities with current Industry Standards for Physical Security, providing monitorization and protection of critical assets, which saves potential costs from future damage or theft.	2022 Q2	$34.30	Section III C
SCADA RTU Replacement	PREPA has 349 Remote Terminal Units (RTU) that form its Transmission and Distribution Supervisory Control and Data Acquisition (SCADA) system, providing monitoring and operation of the devices within its substations. The RTUs collect data from site-level devices and provide subsets of that data to the EMS. The EMS collects this data from the RTUs for monitoring, storing, and analyzing purposes. Additionally, the EMS sends controls to the RTUs and the RTUs pass these controls to the respective site-level devices for operation. Damage caused by Hurricane María resulted in the replacement of thirty-five (35) of the existing RTUs. An additional Ninety-nine (99) of the existing RTUs have been identified to have system interoperability issues from lack of Distributed Network Protocol (DNP3) support and Internet Protocol (IP) support. A total of 134 new RTUs are needed as part of near-term projects for the SCADA system. The new RTUs will be up to date with current technology and will support remote access requirements. All communications-capable protective relays, meters, network devices and other intelligent electronic devices (IEDs) will receive remote access through RuggedCom's	2022 Q2	$32.44 Note: Funded through 428 and PREPA NME	Section III E

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	Crossbow platform. Crossbow provides an integrated, comprehensive solution with a seamless configuration environment, ensuring IED connectivity and activity logging is maintained at the substation level, even if the connection to the central server is temporarily disabled. In addition to capturing compliance record information, the project will ensure Crossbow connectivity to all appropriate devices identified at the 134 substation locations.			
Meter & Automation Lab	The objective of this project is to build a PREPA meter and automation lab. Building and maintaining PREPA's modern processor-based systems will require a Meter & Automation Laboratory, that will allow for testing (prior to installation) of any automation equipment to be deployed within the grid.	N/A	$14.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Telecom Infrastructure	PREPA's communication towers and telecommunication buildings suffered severe damage during Hurricane María. Most of the towers were damaged beyond repair and must be replaced. The telecommunication buildings are of concrete-block construction and suffered damage. This project will cover replacement of 50 towers, and repair of 20 buildings at standalone telecom sites. Several sites are within US Forest Service or PR Department of Natural Resources protected land and must adhere to federal and state requirements for building aesthetics. Additional construction regulations or permits may be required. Replacement of towers provides a hardened telecommunications network, to help mitigate damage from future weather-related events, increasing reliability. Where possible, replacement with taller towers will provide better coverage of the LMR system and provide space for future RF solutions.	2022 Q2	$9.86 Note: Funded through 428 and PREPA NME	Section III C
Microwave PTP	The PREPA transmission microwave network consists of multiple point to point (PTP) microwave (MW) links. These PTP links utilize licensed frequencies granted by the Federal Communications Commission (FCC) in both the 6 GHz and 11 GHz MW bands. The FCC license database list 49 actively licensed links in the 6 GHz band and 8 actively license links in the 11 GHz band. Damage by hurricanes and outdated technology require that all links will be rebuilt in support of updated and reliable connectivity of the network.	2022 Q2	$6.86	Section III C

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	The MOR specified replacement microwave equipment to be the AVIAT Eclipse radios. The implementation of the new transmission PTP MW equipment is dependent on restoring or rebuilding the required site facilities and towers. This effort will need microwave system planning coordination and construction will start prior to implementation of the new MW systems. The systems implementation will most likely lag the tower construction by a year.			
IT Corporate Network	Hurricane María destroyed a significant amount of Corporate IT network equipment in various facilities across PREPA's service territory. Most of these pieces of equipment can be replaced like-for-like, but with upgraded functionality and more hardened and robust versions of the equipment. This project will evaluate current communication and computation needs at all facilities, establishing a baseline from which the network will be rebuilt. An additional focus of this project will be to coordinate with other functional areas, such as cybersecurity and transport for backbone connectivity and physical security projects for maximum efficiency, resiliency, and any coordinated advantages. This project will support improved management of the network and support of end of life and end of support timelines and allow for future repair and replacement in the event of system expansion or damage.	2022 Q2	$6.86	Section III C
Advanced Metering Infrastructure (AMI)	Roughly 25% of PREPA's Automatic Meter Reading (AMR) system was destroyed by Hurricane María, requiring the use of manual billing and meter reading. Replacing damaged meters with like-for-like meters, addresses the revenue and manual process issue, but does not address other current and future needs, such as outage notification. This project will replace the current obsolete metering system with a new Advanced Metering Infrastructure (AMI) system that provides faster response times, more accurate and reliable data, better system controls and system monitoring, support for direct customer information to home (HAN) capabilities, and building energy management systems (EMS).	2022 Q2	$0.00 Note: Cost to be estimated in a future plan update	Section III E

Buildings – Near-Term (2021-2023)

Table 4.9 – Near-Term Buildings Projects

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
FAASt Aguadilla Electric Service Center (Building)*	The objective of this project is to repair and/or replace hurricane and flood-damaged structures, utilities, and finishes to bring the entire Electric Service Center into proper working order. A flood study will be performed to determine if additional hazard mitigation will be required to avoid future damage from storms.	2021 Q4	$2.50	Section III C
FAASt Arecibo Regional Office Building (Building)*	The objective of this project is to relocate the Arecibo ESC to a new location that is not subject to flooding during severe weather events. During Hurricane María, the Arecibo Electric Service Center (ESC) experienced 7-8' of water across the entire 8-acres site and was consequently not able to be used for its intended purpose as an emergency service center.	2021 Q4	$2.31	Section III C
Palo Seco North & South	Twenty-seven buildings at the Palo Seco power plant were inspected and reported to have suffered damages from Hurricane María. The objective of the project is to repair and/or replace the damaged structures, utilities, and finishes to bring the buildings back into proper working order.	2021 Q4	$2.00	Section III C
FAASt Arecibo Electric Service Center (Building)*	The objective of this project is to repair and/or replace hurricane and flood-damaged equipment, utilities, and finishes to bring the entire office building into proper working order.	2021 Q4	$1.80	Section III C
San Germán ESC	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring the entire Electric Service Center into proper working order.	2022 Q2	$0.31	Section III C
Bayamón Region Miscellaneous Repairs	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring impacted buildings into proper working order.	2022 Q2	$0.23	Section III C

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Toa Baja Technical Services	The objective of this project is to repair and/or replace hurricane and flood-damaged equipment, utilities, and finishes to bring the entire Technical Services Building into proper working order.	2021 Q4	$0.19	Section III C
Mayagüez Region Miscellaneous Repairs	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring impacted buildings into proper working order.	2022 Q2	$0.17	Section III C
Arecibo Region Miscellaneous Repairs	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring impacted buildings into proper working order.	2022 Q2	$0.13	Section III C
Caguas Region Miscellaneous Repairs	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring impacted buildings into proper working order.	2022 Q2	$0.10	Section III C
Ponce Region Miscellaneous Repairs	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring impacted buildings into proper working order.	2022 Q2	$0.07	Section III C
Carolina Region Miscellaneous Repairs	The objective of this project is to repair and/or replace hurricane-damaged equipment, utilities, and finishes to bring impacted buildings into proper working order.	2022 Q2	$0.06	Section III C
Ponce Warehouse at Ponce ESC	The objective of this project is to completely replace the existing Ponce warehouse with a new, code-compliant warehouse building.	2021 Q4	$0.00 Note: Cost to be estimated in a future plan update	Section III C
Ponce Calle Villa	The objective of this project is to completely replace the existing Ponce Calle Villa warehouse with a new, code-compliant warehouse building.	2021 Q4	$0.00 Note: Cost to be estimated	Section III C

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
			in a future plan update	

Environmental – Near-Term (2021-2023)

Table 4.10 – Near-Term Environmental Projects

Environmental Category Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Access Roads (Grouped)*	This project will repair hurricane-damaged and unstable access roads, repair contours along impacted access roads, repair elevations to NWI, FEMA Flood Hazard, remove eroded fill within USACE Surface Water features, and capture as-built topography data post-construction. The repairs on these access roads will ensure compliance with EPA Clean Water Act in correspondence to the National Pollutant Discharge Elimination System (NPDES) permit program and USACE Nation Wide Permit #33 and #12.	2021 Q4	$15.19	Section III C

E. Mid-Term Category Overview

The mid-term priority category is comprised of projects estimated to begin 30% A/E design work in 2024-2027. Note that LUMA has not yet had the chance to review and update all mid-term projects and therefore has not updated the T&D projects in this section. They will be reviewed and revised as required in a future plan update. The information contained in this section for T&D projects is the same as the March version of the 10-Year Plan.

In the sections that follow, we provide this information on mid-term priority projects:

Table 4.11 – Provided Project Information

Section	Plan Information Provided
1. Description of projects	An overview of the projects in the priority category and the approach used to designate them, organized by asset type
2. Summary of projects	Number of projects by asset category and start year, along with total dollars by asset category
3. COR3 and FEMA submission timeline	Estimated timeline for submittal to indicate number of projects for each year and asset category
4. List of projects	Project name, a brief description, estimated submittal timing, estimated cost, and IRP reference section for each project included in the plan

1. Description of Mid-Term Priority Projects

Generation and Dams and Hydro

The fleet of renewable generation and battery storage projects will continue to grow at a pace that complies with the targets for renewable generation for 2025 and beyond, subject to technical feasibility and financial benefit analysis.

New thermal generation may potentially be added based on results of the New Thermal Generation Feasibility Study and subsequent review and discussion with the PREB.

The retirement of thermal generation units, along with demolition and remediation, restoration, or repurposing plans are also planned for this period.

Dams and Hydro work in the mid-term is focused heavily on addressing damage to dams, reservoirs, and canals from sediment, storm debris, and erosion caused by Hurricanes Irma and Maria. There are also some projects designed to repair hurricane-damages to hydro-electric facilities.

Transmission

Thirty-seven (37) 115kV & 230kV transmission lines and forty-nine (49) 38kV sub-transmission lines will be either hardened or rebuilt in the mid-term once the required detailed engineering assessment and design is completed. There are an additional twenty-nine (29) new 38kV, 115kV & 230kV lines planned as FEMA 406 projects, both overhead and underground.

Distribution

The total number of feeders addressed in the mid-term is approximately 581. This is comprised of three elements. First, 182 feeders from the damage report were included if they were part of the 10-Year Pole Replacement Report and/or had critical customers. These feeders were labeled as the short-term, second tier. Second, we include the remaining 65 feeders from the damage report, those with non-critical customers; these are prioritized after the short term second tier projects. In addition, we included the 386 feeders that are part of the 10 Year Pole Replacement Program.

Substations

Substations are being evaluated for the mid-term period due to storm damage and unreliable equipment. The mid-term projects include modernization; hardening and relocation to meet new codes and standards to improve the resilience and reliability of the electric grid system throughout the island; and including the continuation of the near-term flood mitigation work.

These substations are categorized into four general groups; generation and switchyard modernization, flooded substation relocation, grid concerns, and modernization and hardening. Modernization will include the upgrade of existing protective relays to modern digital relays to improve system protection, replacement of existing oil circuit breakers with vacuum of SF6 gas breakers and eliminate grid constraints. Hardening will include strengthening or replacement of existing control buildings/enclosures, structures, components, to better withstand a storm event.

IT / Telecom

Mid-term telecommunications projects include continuance of projects begun during the near-term phase. These include fiber optics, LMR, microwave radio, infrastructure, field area (radio) networks (FAN), and communications network (IP/MPLS) as described above. Due to complexity and long-lead items, these projects require a long timeline.

In addition, advanced meter infrastructure (AMI) and distribution automation (DA) are slated to begin as infrastructure, transport, and FAN enablement come into production.

Both will significantly enhance customer service and experience through outage detection and advanced, faster, automatic restoration of service to areas impacted by a system fault. DA will include advanced distribution management systems (ADMS) with fault location, isolation, and service restoration (FLISR) capability. FLISR monitors and controls the status of line reclosers and switches; then, in the case of a fault, applies logic to automatically and immediately reconfigure the electric grid localizing the fault to minimize the area suffering a service outage.

Buildings

All planned mid-term projects related to buildings consist of repairs to approximately five facilities that were damaged by the 2017 hurricanes. These building repairs are important to ongoing operational facilities and have been prioritized according to need and/or coordination with other related projects.

Environmental

Environmental permitting and remediation mid-term activities for acquisition or divestiture of real property project categories include: the preparation and agency review/approval of a remediation plan (if applicable).

Mid-term activities will be required for projects that involve construction activities, construction-related soil disturbance, potential impacts to environmental or cultural resources. These activities include the development, submittal, and agency review/approval of permit applications.

Mid-term activities for projects that include the installation or modification of new or existing generating resources include: the initiation of agency consultations and environmental field studies (if applicable) and preparation of applicable permit applications.

Mid-term activities for projects that include generating resource retirements and demolition activities include: the preparation, agency review/approval and implementation of a waste management and remediation plans; and the development, submittal, and agency review/approval of permit applications or modifications. The retirement of thermal generation units, along with demolition and remediation, restoration, or repurposing plans are planned for this period.

2. Summary of Mid-Term Priority Projects

The following table summarizes the near-term project volume and aggregate cost by asset category:

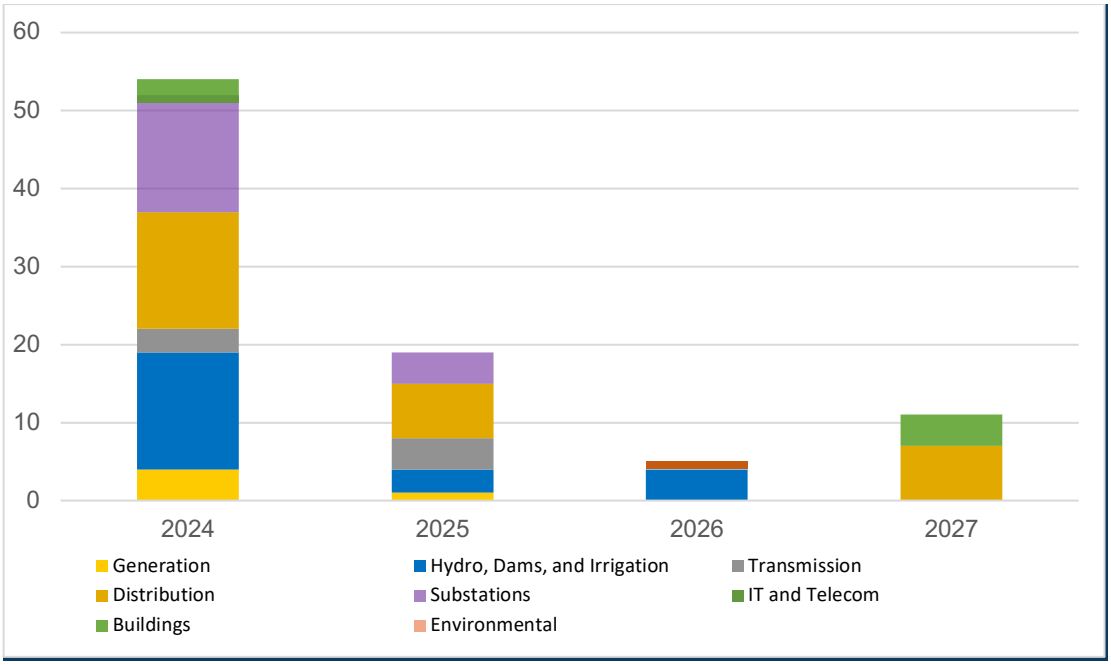
Table 4.12 – Summary of Mid-Term Priority Projects

Asset Category	# of Projects Initiated				Total Projects	Total Cost Estimates (millions)
	2024	2025	2026	2027		
Generation	4	1	0	0	5	$577
Dams, Hydro, and Irrigation	15	3	4	0	22	$229
Transmission	3	4	0	0	7	$1,487
Distribution	15	7	0	7	29	$2,653
Substations	14	4	0	0	18	$755
IT and Telecom	1	0	0	0	1	$103
Buildings	2	0	1	4	7	$48
Environmental	0	0	0	0	0	$0
Total	**54**	**19**	**5**	**11**	**89**	**$5,852**

3. COR3 and FEMA Submission Timeline

The following bar chart shows the estimated timeline for submittal of individual projects to COR3 and FEMA for review and approval:

Figure 4.3 – COR3 and FEMA Mid-Term Project Submissions by Year



4. List of Mid-Term Priority Projects

Generation – Mid-Term (2024-2027)

Table 4.13 – Mid-Term Generation Projects

Generation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
New Generation Near the San Juan Area (Palo Seco)	New generation to be located near the San Juan area (Palo Seco) based on results of the "New Thermal Generation Feasibility Study" project performed in the near-term. Type and size of generation to be determined based on results of the feasibility study, review and discussion with the PREB, and subsequent PREB Order on the matter. New generation is required to address a power generation crisis created by the weakening of Puerto Rico's electric grid in the wake of Hurricane María. New generation should be capable of withstanding major catastrophic events, such as hurricanes, high wind events, and	2024	$572.40	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	major seismic events. In alignment with the March 26th PREB Order, this project will include renewable energy sources and battery energy storage.			
Cambalache Main Power Transformers	The power plant main and auxiliary power transformers at Cambalache have been operating for over 23 years and are nearing the end of their useful life. This project is to maintain and replace these transformers in the mid-term.	N/A	$5.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
New Black Start System at Aguirre	To comply with the 81MW limit on new gas-fired thermal peakers allowed under the IRP Order, PREPA is updating its approach for this project. The units to be installed to black start the Aguirre plant will be approximately 2 MW, will be used exclusively to power loads within the Aguirre plant, and will not be connected to the grid, As they are no longer connected to the grid and do cannot operate as peaking units, they would not count toward the limit on new peaker generation.	2024	TBD Note: Funded through PREPA NME; cost to be estimated in a future plan update	Section III C
Retirement of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2)	According to the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan (IRP) issued in July 2020, the Puerto Rico Energy Bureau (PREB) approved PREPA's plans for retirement of the oil-fired steam resources over the next five (5) years and warns PREPA that undue delays in the retirement of these units will result in stringent penalties.	N/A	TBD Note: Funded through PREPA NME with cost to be estimated in a future plan update	Section III C
Demolition of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2, Costa Sur U1-U4)	According to the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan (IRP) issued in July 2020, the Puerto Rico Energy Bureau (PREB) approved PREPA's plans for retirement of the oil-fired steam resources over the next five (5) years and warns PREPA that undue delays in the retirement of these units will result in stringent penalties. As these plants are retired, they will be demolished to make	N/A	TBD Note: Funded through PREPA NME PREPA NME with cost to be estimated in	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	room at each of these facilities for other uses.		a future plan update	

Dams & Hydro – Mid-Term (2024-2027)

Table 4.14 – Mid-Term Dams & Hydro Projects

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Dos Bocas Reservoir	The Dos Bocas Reservoir is supplied by the Río Grande de Arecibo, the Río Caonillas, and the Río Limón. This reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2024	$58.25	Section III C
Lajas Lateral Canals	The Lajas Lateral Canal damage was primarily caused by surface runoff carrying debris and soil erosion caused by heavy rainfall. Project scope includes repairing and replacing damaged concrete lining, which is cracked, displaced, and scouring below the surface of the lining. It also includes repairing the road with fill material.	2026	$55.33	Section III C
Caonillas Reservoir	The Caonillas Reservoir is supplied by the Vivi, Pellejas, Jordan, and Adjuntas reservoirs as well as the Río Caonillas. This reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2024	$41.74	Section III C
Lucchetti Reservoir	The Lucchetti Reservoir is supplied by the Río Yauco, the Río Naranjo, and Yauco Plant 1. This reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2027	$35.81	Section III C
Guayo Reservoir	The Guayo Reservoir is supplied by Río Guayo, Río Cidra, and the Yahuecas Reservoir. This reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2027	$21.01	Section III C

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Guayabal Reservoir	The Guayabal Reservoir is supplied by Toro Negro Plant 1 via Río Jacaguas and the Toa Vaca Reservoir via Río Toa Vaca. This reservoir captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2025	$7.75	Section III C
Matrullas Reservoir	The Matrullas Reservoir is supplied by Río Matrullas and captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2025	$3.08	Section III C
Garzas Reservoir	The Garzas Reservoir is supplied by the Río Las Vacas and captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2025	$1.53	Section III C
Guineo Reservoir	The Guineo Reservoir is supplied by Río Toro Negro and captured large quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.	2025	$1.25	Section III C
Guamaní Canal	The Guamaní Canal and adjacent areas were damaged from rushing waters and debris from heavy rainfall, flash flooding, and landslides. This project restores the existing canal and surrounding site improvements by rebuilding the damaged dam and flume, including base, walls, columns, support beams. Additionally, the canal's concrete lining and potential scoured soil underneath canal will be repaired. The concrete bridge shall be repaired and replaced in-kind, and earthen or gravel fill materials for all damaged areas will be provided.	2025	$0.87	Section III C
Toro Negro 2	The purpose of this project is to restore/repair the Toro Negro 2 hydropower plant from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage from water and debris inside the power building affecting critical generation equipment. With this	2024	$0.84	Section III C

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.			
Vivi Dam	The Vivi Dam damaged was primarily caused by high winds, water runoff, excess sedimentation brought in by the storm, increased wave action, and wind-blown debris. Damages include eroded areas, doors, windows, electrical components, sluice gate hydraulic hoist and hydraulic power unit, railings, fencing, access road and parking area, and sedimentation of intake rack structure and surroundings.	2025	$0.43	Section III C
Lajas Irrigation Canals	The Lajas Irrigation Canal damage was primarily caused by high winds, wind-blown debris, and surface runoff carrying debris and soil erosion caused by heavy rainfall. Project scope includes repairing and replacing damaged concrete lining, which is cracked, displaced, and scouring below the surface of the lining. It also includes replacing concrete blocks, concrete water pit, radial flood gate, steel alloy stair, and gate.	2026	$0.31	Section III C
Caonillas Dam	The Caonillas Dam damage was primarily caused by drains at the crest of the dam clogging and causing the gallery to flood and erosion at the upstream slope of the reservoir. The project would replace or repair damaged equipment and infrastructure in the flooded gallery, remove sedimentation buildup in foundation drainage holes, sluiceway intake rack and surroundings, and drainage piping, and stabilize eroded areas surrounding the dam.	2024	$0.19	Section III C
Carite Dam	The Carite Dam damage was primarily caused from high winds, wind-blown debris, landslides, floodwaters discharge, and surface flow erosion. This project will repair these damages including the reservoir spillway, erosion, access roads, parking areas, safety railing, valves, gabion baskets, expansion joints, access bridge to intake tower, and intake tower structure to restore the dam back to pre-hurricane functionality.	2025	$0.14	Section III C
Garzas 1	The purpose of this project is to restore/repair the Garzas Hydroelectric Power Plant No. 1 from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as	2024	$0.13	Section III C

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	interior damage to battery systems as a result of lack of power in the electrical grid. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.			
Guayo Dam	The Guayo Dam damaged was primarily caused by high winds, water runoff, heavy rains, fallen debris, and wind-blown debris. Damages include electrical lines, access road, sluice gate hydraulic hoist and hydraulic power unit, door to communication shed, and a chain link swing gate.	2026	$0.13	Section III C
Garzas 2	The purpose of this project is to restore/repair the Garzas Hydroelectric Power Plant No. 2 from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage to battery systems as a result of lack of power in the electrical grid. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2025	$0.12	Section III C
Yauco 2	The purpose of this project is to restore/repair the Yauco Hydroelectric Power Plant No. 2 from hurricane/flooding damage suffered as a result of Hurricane María. The plant sustained exterior site and equipment damage as well as interior damage affecting critical generation equipment. With this project, the intent is to evaluate all claims submitted to FEMA for the settlement and develop individual scope of work, execution timeline, sequence, and cost estimates to complete the needed Hurricane María related repairs.	2024	$0.08	Section III C
Coamo Dam	The Coamo Dam damage was primarily caused from erosion when spillway floodwaters were discharged at the dam. These damages include fencing, slope erosion, and cracks in the dam's gallery. This project would restore the fencing, fill the gallery cracks with epoxy, repair eroded areas, and install concrete barrier to mitigate further issues with erosion.	2024	$0.08	Section III C
Pellejas Dam	The Pellejas Dam damaged was primarily caused by high winds, water runoff and wind-blown debris. Damages include electrical components, sluice gate hydraulic hoist and hydraulic power unit, railings, access road and	2024	$0.06	Section III C

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	parking area, and sedimentation of intake rack structure and surroundings.			
Adjuntas Dam	The Adjuntas Dam damaged was primarily caused by high winds, heavy rains, landslides, water runoff and fallen debris. Damages include doors, cracked walls, conduits and electrical systems, sluice gate hydraulic hoist and hydraulic power unit, railings, access road and parking area, sedimentation of intake rack structure and surroundings, and drainage piping.	2025	$0.05	Section III C

Transmission – Mid-Term (2024-2027)

Table 4.15 – Mid-Term Transmission Projects

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
32-Transmission Existing (115 & 230 kV)	The objective of this project is to harden existing 115kV and 230kV transmission lines to consensus-based codes and standards, improve reliability and resiliency of the infrastructure to critical loads, and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on 37 transmission lines for an estimated total of 496 miles.	2025	$475.54	Section III C
31-Transmission Existing (38 kV)	The objective of this project is to harden existing 38kV transmission lines to consensus-based codes and standards, improve reliability and resiliency of the infrastructure to critical loads, and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on 40 transmission lines for an estimated total of 511 miles.	2025	$180.92	Section III C
16-Transmission New Lines (38kV, 115 & 230 kV)	The objective of this project is to build new underground or overhead transmission lines across all three voltage levels (38 kV, 115 kV, and 230 kV) to consensus-based codes and standards and increase the transmission grid reliability and resiliency by providing redundancy to existing disaster damaged lines. This project includes work on 16 transmission lines for an estimated total of 125 miles.	2026	$294.00	Section III E
13-Transmission New Lines (38kV, 115 & 230 kV)	The objective of this project is to build new underground or overhead transmission lines across all three voltage levels (38 kV, 115 kV, and 230 kV) to consensus-based codes and standards and increase the transmission grid reliability and resiliency by providing redundancy to existing disaster damaged lines. This project includes work on 13 transmission lines for an estimated total of 53 miles.	2025	$211.67	Section III C
9-Transmission Existing (38kV)	The objective of this project is to harden existing 38kV transmission lines to consensus-based codes and standards, improve reliability and resiliency of the infrastructure to critical loads, and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project	2024	$137.70	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	includes work on 9 transmission lines for an estimated total of 140.5 miles.			
Existing 38 kV - Line 7300 Baldrich Sect to San Jose TO	The objective of this project is to repair and harden disaster-damaged 38kV line 7300 to consensus-based codes and standards, including replacement of temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 2.1 miles of transmission lines.	2025	$4.21	Section III C
Existing 38 kV - Line 7200 Baldrich Sect to Escuela Industrial TO	The objective of this project is to repair and harden disaster-damaged 38kV line 7200 to consensus-based codes and standards, including replacement of temporary emergency repairs with permanent ones. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 1.2 miles of transmission lines.	2025	$2.43	Section III C

Distribution – Mid-Term (2024-2027)

Table 4.16 – Mid-Term Distribution Projects

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Distribution Feeders - Intermediate Term Group - Tier 1 - Mayagüez Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 57 distribution feeders for an estimated total of 322.53 miles (including both overhead and underground work).	2024	$68.37	Section III C
Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 134 distribution feeders for an estimated total of 134.39 miles (including both overhead and underground work).	2025	$79.43	Section III C
Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 36 distribution feeders for an estimated total of 202.47 miles (including both overhead and underground work).	2024	$113.72	Section III C
Distribution Feeders - Intermediate Term Group -	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in	2024	$74.75	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Tier 2 - Bayamón Region	faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 40 distribution feeders for an estimated total of 121.04 miles (including both overhead and underground work).			
Streetlights - All Regions	The Smart Street Lighting project is a critical component of the plan to build back a more reliable and resilient grid in Puerto Rico. The project will require a two-part approach to repair the broken streetlights throughout the island followed by a permanent smart streetlight solution for all 481,000 units. In addition to repairing damage from the 2017 hurricanes, the smart street lighting solution will provide improve reliability and safety, increased resiliency, energy and cost savings, platform for additional smart city technologies, economic development, enhanced billing structure, and improved relationships with municipalities. The streetlight project will leverage either (or both) RF mesh and PLC networks which are two of the most common communication solutions today. Effective mesh networks are self-configuring and self-healing. PLC technology creates a network over a city's power lines, which are connected to most streetlights already. In some deployments, PLC is used to connect the streetlights and the mesh network is added for any additional sensors needed to deploy other smart city applications.	2024	$185.50	Section III C
Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 33 distribution feeders for an estimated total of 144.56 miles (including both overhead and underground work).	2024	$113.45	Section III C
Distribution Feeders - Intermediate Term Group -	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in	2024	$170.24	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Tier 2 - San Juan Region	faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 53 distribution feeders for an estimated total of 80.27 miles (including both overhead and underground work).			
Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 30 distribution feeders for an estimated total of 68.39 miles (including both overhead and underground work).	2024	$63.82	Section III C
Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 24 distribution feeders for an estimated total of 68.6 miles (including both overhead and underground work).	2024	$113.49	Section III C
Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 32 distribution feeders for an estimated total of 93.67 miles (including both overhead and underground work).	2024	$285.86	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamón Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 23 distribution feeders for an estimated total of 108.71 miles (including both overhead and underground work).	2024	$102.43	Section III C
Distribution Feeders - Intermediate Term Group - Tier 2 - Mayagüez Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 29 distribution feeders for an estimated total of 62.96 miles (including both overhead and underground work).	2024	$123.86	Section III C
Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 20 distribution feeders for an estimated total of 103.91 miles (including both overhead and underground work).	2024	$34.99	Section III C
Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 45 distribution feeders for an estimated total of	2024	$59.50	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	77.27 miles (including both overhead and underground work).			
Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 29 distribution feeders for an estimated total of 79.72 miles (including both overhead and underground work).	2025	$114.19	Section III C
Distribution Feeders - Long Term Group - Tier 1 - Mayagüez Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 32 distribution feeders for an estimated total of 44.06 miles (including both overhead and underground work).	2025	$122.98	Section III C
Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 26 distribution feeders for an estimated total of 38.66 miles (including both overhead and underground work).	2025	$44.17	Section III C
Distribution Feeders - Long Term Group - Tier 1 - Bayamón Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical	2025	$45.74	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	customers, and preparing the system for a future distribution automation system. This project includes work on 24 distribution feeders for an estimated total of 29.31 miles (including both overhead and underground work).			
Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 21 distribution feeders for an estimated total of 33.5 miles (including both overhead and underground work).	2025	$49.42	Section III C
Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 25 distribution feeders for an estimated total of 29.56 miles (including both overhead and underground work).	2027	$122.53	Section III C
Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 25 distribution feeders for an estimated total of 23.92 miles (including both overhead and underground work).	2027	$61.11	Section III C
Distribution Feeders - Intermediate Term Group -	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in	2024	$66.26	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Tier 2 - Ponce Region	faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 12 distribution feeders for an estimated total of 25.81 miles (including both overhead and underground work).			
Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 13 distribution feeders for an estimated total of 29.81 miles (including both overhead and underground work).	2027	$42.47	Section III C
Distribution Feeders - Long Term Group - Tier 2 - Bayamón Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 20 distribution feeders for an estimated total of 25.88 miles (including both overhead and underground work).	2027	$108.18	Section III C
Distribution Feeders - Long Term Group - Tier 2 - Mayagüez Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 20 distribution feeders for an estimated total of 23.18 miles (including both overhead and underground work).	2027	$36.85	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 7 distribution feeders for an estimated total of 18.15 miles (including both overhead and underground work).	2024	$84.43	Section III C
Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 17 distribution feeders for an estimated total of 18.28 miles (including both overhead and underground work).	2027	$36.30	Section III C
Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 11 distribution feeders for an estimated total of 15.23 miles (including both overhead and underground work).	2027	$76.03	Section III C
Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	The objective of this project is to restore PREPA's distribution system to consensus-based codes and standards, reduce the outage impact of future disaster events, and increase the resilience of the system to aid in faster recovery. This will be accomplished by strengthening critical sections of overhead distribution facilities, providing underground express feeds to critical customers, and preparing the system for a future distribution automation system. This project includes work on 9 distribution feeders for an estimated total of	2025	$105.72	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	9.63 miles (including both overhead and underground work).			

Substations – Mid-Term (2024-2027)

Table 4.17 – Mid-Term Substations Projects

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Mid-Term Grid Concern Substations	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. In addition, the Integrated Resource Plan and Grid Constraint studies identified the need to build multiple new transmission lines to improve grid resiliency. The addition of these new transmission lines will require substation expansions to accommodate the required equipment for the line terminals. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2024	$204.00	Section III C
Hydro Generating Units – Switchyard Grid Modernization	The separation of transmission and generation assets will support the transmission system concession agreement and will support the independent operation of the assets. To provide physical separation between the generation and transmission switchyard assets, all protective relays and controls will be relocated from generating facility to a control enclosure within the outside switchyard property. In addition, independent switchyard revenue metering, auxiliary power and DC Systems will be installed to support the asset separation.	N/A	$100.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Mid-Term Modernization & Hardening Substations	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. In addition, the Integrated Resource Plan and Grid Constraint studies identified the need to build multiple new transmission lines to improve grid resiliency. The addition of these new transmission lines will require substation expansions to accommodate the required equipment for the line terminals. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2024	$93.50	Section III C
San Juan 115kV GIS	This project will expand, modernize, and harden San Juan SP 115kV TC by replacing existing Air Insulated Substation (AIS) with Gas Insulated Substation (GIS), installing substation inside a building(s), expanding substation capacity to allow future generation and to	2024	$64.60 Note: Funded through	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	complete San Juan 115kV Underground Transmission Loop, and replacing aging infrastructure including six (6) Oil Circuit Breakers (OCBs). In addition, PREPA will install new protection and controls in substation, rather than power plant control room and install revenue grade metering to measure power flows for billing.		428 and PREPA NME	
Costa Sur Generation & Transmission Modernization and Hardening	The Costa Sur Generation and Switchyard project will install new prefabricated control enclosures in the switchyards to house the new equipment along with the new associated cables upgrade the protective relays at the remote ends, and install new switchyard revenue metering, auxiliary power and DC Systems. This project will improve system reliability and operations, modernize and harden the generation and transmission assets, and ensure compliance with consensus-based codes and standards including IEC 61850.	N/A	$52.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
T-Line Substation Terminals	The Integrated Resource Plan and Grid Constraint studies indicate 14 new transmission lines will need to be constructed that will require the expansion of approximately 18 existing transmission substations to accommodate 28 new line terminals. The objective of this project is to plan the modernization and hardening of these substations to facilitate the new transmission line connections with latest industry standards and improve grid resiliency.	2024	$47.90	Section III E
Aguirre Generation & Switchyard Modernization & Hardening	The Aguirre Generation and Switchyard project will install new prefabricated control enclosures in the switchyards to house the new equipment along with the new associated cables upgrade the protective relays at the remote ends, and install new switchyard revenue metering, auxiliary power and DC Systems. This project will improve system reliability and operations, modernize and harden the generation and transmission assets, and ensure compliance with consensus-based codes and standards including IEC 61850.	N/A	$36.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Mayagüez Generation & Transmission Modernization and Hardening	The Mayagüez Generation and Switchyard project will install new prefabricated control enclosures in the switchyards to house the new equipment along with the new associated cables upgrade the protective relays at the remote ends, and install new switchyard revenue metering, auxiliary power and DC Systems. This project will improve system reliability and operations, modernize and harden the generation and transmission assets, and	N/A	$34.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	ensure compliance with consensus-based codes and standards including IEC 61850.			
Palo Seco Generation & Transmission Modernization and Hardening	The Palo Seco Generation and Switchyard project will install new prefabricated control enclosures in the switchyards to house the new equipment along with the new associated cables upgrade the protective relays at the remote ends, and install new switchyard revenue metering, auxiliary power and DC Systems. This project will improve system reliability and operations, modernize and harden the generation and transmission assets, and ensure compliance with consensus-based codes and standards including IEC 61850.	N/A	$32.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Mid-Term Gen. & Switchyard Modernization Substations	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. In addition, the Integrated Resource Plan and Grid Constraint studies identified the need to build multiple new transmission lines to improve grid resiliency. The addition of these new transmission lines will require substation expansions to accommodate the required equipment for the line terminals. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards. The scope of this project includes Substations with Distribution Work and 50 Substation with Transmission Work.	2024	$28.67	Section III C
Río Blanco TC Grid Constraint Mitigation	This project will address the damaged adjacent assets to the Río Blanco TC by rebuilding it with GIS and a connection to the 230kV Line 50800. The addition of the 230kV connection to Río Blanco will provide a significant improvement to the reliability and resiliency to the grid in the East part of the Island. The connection of Line 50800 at the Río Blanco TC will alleviate the potential 115-kV system overload and improve reliability of the system. This project will improve the grid stability as additional solar facilities are contemplated and constructed in the East.	N/A	$20.00 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Río Blanco Generation & Transmission Modernization and Hardening	The Río Blanco Generation and Switchyard project will install new prefabricated control enclosures in the switchyards to house the new equipment along with the new associated cables upgrade the protective relays at the remote ends, and install new switchyard revenue metering, auxiliary power and DC Systems. This project	N/A	$18.00 Note: Funded through	N/A Necessary PREPA Maintenance

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	will improve system reliability and operations, modernize and harden the generation and transmission assets, and ensure compliance with consensus-based codes and standards including IEC 61850.		PREPA NME	
Cambalache Generation & Transmission Modernization and Hardening	The Cambalache Generation and Switchyard project will install new prefabricated control enclosures in the switchyards to house the new equipment along with the new associated cables upgrade the protective relays at the remote ends, and install new switchyard revenue metering, auxiliary power and DC Systems. This project will improve system reliability and operations, modernize and harden the generation and transmission assets, and ensure compliance with consensus-based codes and standards including IEC 61850.	N/A	$17.60 Note: Funded through PREPA NME	N/A Necessary PREPA Maintenance
Naguabo 2701	The objective is to replace damaged control house and other related damaged equipment and to conform this critical asset substation facility to PREPA and industry standards, improve system resiliency, and to mitigate safety hazards due to equipment damage and environmental concerns.	2024	$4.70	Section III C
Hato Rey TC GIS UG Terminal	Hato Rey TC is an existing 230/115/38-kV transmission center. A new 38 kV line terminal is required to connect a new underground transmission line coming from Veteran's Hospital in Río Piedras. Gas Insulated Technology (GIS) will be used for the switchgear. The objective is to add a new line terminal with environmentally friendly and high reliable equipment to serve the medical facility, use PREPA and industry standards and improve system resiliency, flexibility, and redundancy to this critical area.	2024	$1.70	Section III C
Short-Term Gen. & Switchyard Modernization Substations - Project Description	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2024	$0.00 Note: Cost to be estimated in a future plan update	Section III C
Short-Term Grid Concern Substations - Project Description	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. The objective of this project is to	2024	$0.00 Note: Cost to be estimated	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	plan the modernization and hardening of these grid concern substations to bring to industry standards.		in a future plan update	
Short-Term Modernization & Hardening Substations - Project Description	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2024	$0.00 Note: Cost to be estimated in a future plan update	Section III C

IT / Telecom – Mid-Term (2024-2027)

Table 4.18 – Mid-Term IT/Telecom Projects

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
SCADA	PREPA has 349 RTUs that form its Transmission SCADA (Supervisory Control and Data Acquisition) system, which provides monitoring and operation of the devices in substations. All PREPA's RTUs must be moved from serial to Ethernet due to damage from Hurricane María impacting the reliability of some systems that are now being upgraded. These equipment upgrades require RTU upgrades to support EMS functionality and overall system interoperability and will require a new communications transport network at each substation. The changes described above will improve PREPA's cybersecurity posture, allow for system-wide equipment standardization, reduce future downtime, and enhance SCADA system reliability. In addition, PREPA interfaces with 806 privately-owned substations and damages from Hurricane María demonstrated that PREPA needs to have SCADA at each of these substations to improve reliability and provide real-time status information. This change will require the installations of an RTU and telecommunications equipment at each of the privately-owned substations and a network for communications support. This project will allow for remote management of PREPA's transmission system, improving essential customer service and reliability while reducing operation and maintenance costs.	2024	$102.90	Section III C

Buildings – Mid-Term (2024-2027)

Table 4.19 – Mid-Term Buildings Projects

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Intermediate ESC Projects	The objective of this project is to repair and/or replace damaged site amenities, roofs, equipment, and finishes as required to bring the Humacao, Juana Díaz, Vieques, Culebra, Mayagüez, and Quebradillas Electric Service Centers into proper working order. The Electric Service Centers are required to support the generation, transmission, and distribution of power throughout the island.	2024	$19.12	Section III C
Long Term ESC Projects	The objective of this project is to repair and/or replace damaged site amenities, roofs, equipment, and finishes as required to bring the Barranquitas, Carolina, Ponce, Utuado, Caguas, Canóvanas, Corozal, Fajardo, Guayama, Guaynabo, Manatí, San Juan-Sabana Llana, and San Juan-Monacillo Electric Service Centers into proper working order. The Electric Service Centers are required to support the generation, transmission, and distribution of power throughout the island.	2027	$17.80	Section III C
Intermediate Improvement and Construction	The objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, finishes, and trailers in the Improvement and Construction complexes serving regions across the island. This includes sites and buildings associated with the Humacao, Mayagüez, and Fajardo Improvement and Construction complexes.	2024	$5.54	Section III C
Long Term Commercial Office Projects	The objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes to bring Commercial Offices into proper working order to provide adequate and reliable customer service throughout the island. This includes sites and buildings associated with the Cayey, Guayama, Hormigueros, Isabela, Juana Díaz, Corozal, and San Sebastián Commercial Offices.	2027	$3.52	Section III C
Cataño Power Service Workshop	The objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes at the Cataño Power Service Workshop.	2027	$1.20	Section III C

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Humacao Commercial Office	The objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes at the Humacao Commercial Office.	2027	$0.27	Section III C
CAGUAS ICEE (Former Caguas' Commercial)	The objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes at the Caguas Irregular Consumption of Electrical Energy (ICEE) Office.	2026	$0.16	Section III C

F. Long-Term Category Overview

The long-term priority category is comprised of projects estimated to begin 30% A/E design work in 2028-2030. Similar to the mid-term, LUMA has not yet had the chance to review and update all long-term projects and therefore has not updated the T&D projects in this section. They will be reviewed and revised as required in a future plan update. The information contained in this section for T&D projects is the same as the March version of the 10-Year Plan.

In the sections that follow, we provide this information on long-term priority projects:

Table 4.20 – Provided Project Information

Section	Plan Information Provided
1. Description of projects	An overview of the projects in the priority category and the approach used to designate them, organized by asset type
2. Summary of projects	Number of projects by asset category and start year, along with total dollars by asset category
3. COR3 and FEMA submission timeline	Estimated timeline for submittal to indicate number of projects for each year and asset category
4. List of projects	Project name, a brief description, estimated submittal timing, estimated cost, and IRP reference section for each project included in the plan

1. Description of Long-Term Priority Projects

Generation and Dams and Hydro

Generation projects are all scheduled to commence prior to 2028, so there are no new projects listed in the long term of the 10-Year Plan. Generation projects started in prior years of the 10-Year Plan will continue to be executed in the Long-Term. If projects are added to the Long-Term in subsequent updates to the 10-Year Plan, they will likely consist of further increasing the renewable generation and battery storage on the island to meet the established RPS targets per year.

Future potential Long-Term projects might also include implementation of any grid support projects that may be required to allow the system to operate reliably and safely. Any new generation installed prior to the long-term may require some adjustments over time to support increasing levels of renewable generation on the system.

Dams and Hydro projects in the long-term are focused on completing repairs to dams and reservoirs caused by sediment, storm debris, and erosion.

Transmission

Thirty-two (32) 115kV & 230kV transmission lines and seventy-nine (79) 38kV sub-transmission lines will be either hardened or rebuilt in the mid-term after the required detailed engineering assessment and design is completed. Six (6) additional new 38kV, 115kV & 230kV lines are also planned, both overhead and underground.

Substations

There are approximately 120 substations that are being evaluated in the long-term period due to storm damage and unreliable equipment. The long-term projects include modernization, hardening and relocation to meet new codes and standards to improve the resilience and reliability of the electric grid system throughout the island, including the continuation of work that started in the near and mid-term phases. These substations are categorized into four general groups; generation and switchyard modernization, flooded substation relocation, grid concerns, and modernization and hardening. Modernization will include the upgrade of existing protective relays to modern digital relays and replacement of existing oil circuit breakers with vacuum of SF6 gas breakers. This will improve system protection and eliminate grid constraints. Hardening will include strengthening or replacement of existing control buildings/enclosures, structures, components, to better withstand a storm event and thereby improve grid reliability and resilience.

IT / Telecom

Long-term telecommunications projects include continuance of projects comprised of fiber optics, LMR, microwave radio, infrastructure, FAN, and communications network (IP/MPLS), DA, and AMI as described above. Due to significant complexity and long-lead components, these projects require a long timeline.

Buildings

All planned long-term projects related to buildings consist of repairs to approximately six facilities that were damaged by the 2017 hurricanes. The building repairs are important to ongoing operational facilities and have been prioritized according to need and/or coordination with other related projects.

Environmental

Environmental permitting and remediation long term activities for acquisition or divestiture of real property project categories include: the implementation of the remediation plan and no further action.

Long term activities will be required for projects that involve construction activities, construction-related soil disturbance, potential impacts to environmental or cultural resources. These activities include the implementation of permit requirements.

Long term activities for projects that include the installation or modification of new or existing generating resources include agency review and implementation of respective permits.

Long term activities for projects that include the generating resource retirements and demolition activities include the implementation of waste management and remediation plans or retirement or withdrawal of existing permits.

2. Summary of Long-Term Priority Projects

The following table summarizes the near-term project volume and aggregate cost by asset category:

Table 4.21 – Summary of Long-Term Priority Projects

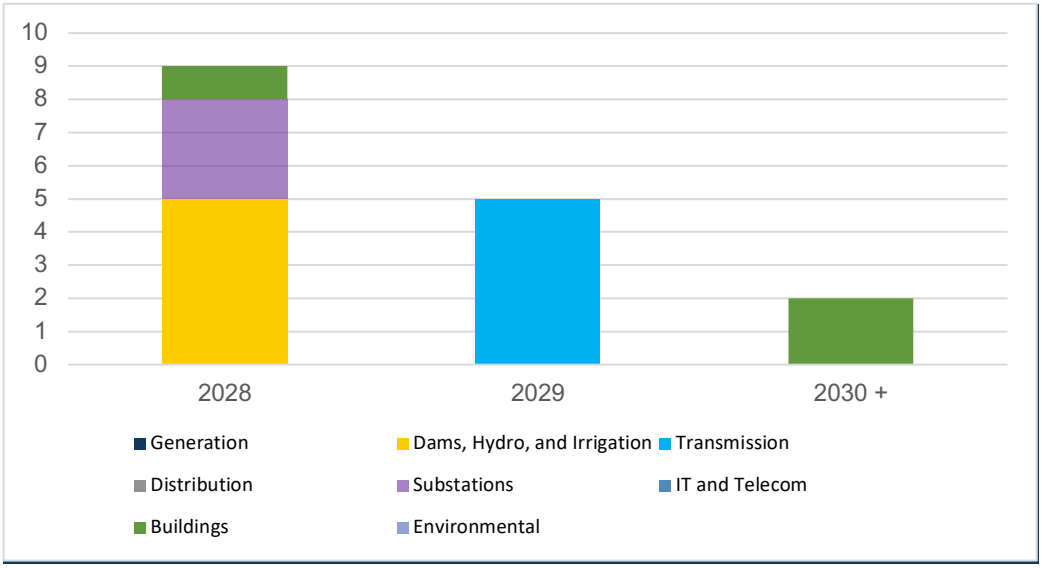
Asset Category	# of Projects Initiated			Total Projects	Total Cost Estimates (millions)
	2028	2029	2030		
Generation	0	0	0	0	$0
Dams, Hydro, and Irrigation	5	0	0	5	$3
Transmission	1	4	0	5	$732
Distribution	0	0	0	0	$0
Substations	3	0	0	3	$156
IT and Telecom	0	0	0	0	$0
Buildings	1	0	2	3	$5

Asset Category	# of Projects Initiated			Total Projects	Total Cost Estimates (millions)
	2028	2029	2030		
Environmental	0	0	0	0	$0
Total	**10**	**4**	**2**	**16**	**$896**

3. COR3 and FEMA Submission Timeline

The following bar chart shows the estimated timeline for submittal of individual projects to COR3 and FEMA for review and approval:

Figure 4.4 – COR3 and FEMA Long-Term Project Submissions by Year



4. List of Long-Term Priority Projects

Dams & Hydro – Long-Term (2028-2030+)

Table 4.22 – Long-Term Dams & Hydro Projects

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Loco Reservoir	The Loco Reservoir is supplied by Yauco Plant No. 1 and No. 2 via the Río Loco. This reservoir captured large	2028	$2.73	Section III C

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	quantities of sediment and debris from heavy rains, surface water runoff carrying debris, soil erosion, and landslides. The project objective is to restore the reservoir storage to a condition optimal for operations, water supply, and flood control.			
Yahuecas Dam	The Yahuecas Dam damage was primarily caused by high winds, additional sedimentation brought on by the storm, wind-blown debris, water runoff, and fallen debris. Damages include access road, vertical trash grill, sedimentation at intake rack structure, fencing, railing, and utility poles.	2028	$0.20	Section III C
Loco Dam	The Loco Dam damaged was primarily caused by high winds, water runoff, heavy rains, fallen debris, wind-blown debris, turbulent discharge of water, and increased wave action. Damages include washed out access road bridge, eroded areas, gates, buoys and buoy floatlines, fencing, access road, wire ropes, electrical components, sedimentation of sluiceway intake rack and surroundings, actuator, and windows.	2028	$0.16	Section III C
Prieto Dam	The Prieto Dam damaged was primarily caused by high winds, heavy rains, water runoff, and fallen debris. Damages include electrical components, mechanical component, access road, hydraulic hoist of sluice gate, hydraulic power unit, sedimentation of sluiceway intake rack and surroundings, safety railing and guardrail on bridge.	2028	$0.10	Section III C
Lucchetti Dam	The Lucchetti Dam damaged was primarily caused by high winds, heavy rains, wind-blown debris, and flooding. Damages include electrical components, utility poles, cracked gallery, AC motor of hydraulic unit, hydraulic power unit, oil pump of hydraulic unit, pressure gauges, actuator, and operator of control gate.	2028	$0.06	Section III C

Transmission – Long-Term (2028-2030+)

Table 4.23 – Long-Term Transmission Projects

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (USD)	IRP Reference
28-Transmission Existing (115 & 230 kV)	The objective of this project is to harden existing 115kV and 230kV transmission lines to consensus-based codes and standards, improve reliability and resiliency of the infrastructure to critical loads, and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on 28 transmission lines for an estimated total of 354 miles.	2029	$322.65	Section III C
79-Transmission Existing (38 kV)	The objective of this project is to harden existing 38kV transmission lines to consensus-based codes and standards, improve reliability and resiliency of the infrastructure to critical loads, and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on 86 transmission lines for an estimated total of 345 miles.	2029	$276.48	Section III C
6-Transmission New Lines (38kV, 115 & 230 kV)	The objective of this project is to build new underground or overhead transmission lines across all three voltage levels (38 kV, 115 kV, and 230 kV) to consensus-based codes and standards and increase the transmission grid reliability and resiliency by providing redundancy to existing disaster damaged lines. This project includes work on 6 transmission lines for an estimated total of 46 miles. This includes new submarine cables to Vieques and Culebra islands.	2029	$101.00	Section III E
Existing 115 kV - Line 40200 Aguirre to Jobos	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 40200 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 9 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system	2029	$15.98	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (USD)	IRP Reference
	limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.			
Existing 115 kV - Line 40100 Aguirre to Jobos	The objective of this project is to replace temporary emergency repairs after Hurricane Maria with permanent repairs and to harden existing 115kV transmission line 40100 to consensus-based codes and standards. Project work is designed to improve reliability and resiliency of the infrastructure serving critical loads and accelerate future restoration efforts by strengthening and/or replacing transmission structures and components. This project includes work on approximately 9 miles of transmission lines prioritized for repair and hardening when taking into account operational considerations regarding system limitations and the ability to take transmission lines out of service for repair and hardening. This project, along with other near-term transmission projects, will lay the foundation that allows transmission lines prioritized for the mid and long-terms to be taken out of service for repair and hardening.	2029	$15.98	Section III C

Substations – Long-Term (2028-2030+)

Table 4.24 – Long-Term Substations Projects

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Grid Concern Substations	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. In addition, the Integrated Resource Plan and Grid Constraint studies identified the need to build multiple new transmission lines to improve grid resiliency. The addition of these new transmission lines will require substation expansions to accommodate the required equipment for the line terminals. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2028	$97.74	Section III C
Modernization & Hardening Substations	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. In addition, the Integrated Resource Plan and Grid Constraint studies identified the need to build multiple new transmission lines to improve grid resiliency. The addition of these new transmission lines will require substation expansions to accommodate the required equipment for the line terminals. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2028	$52.13	Section III C
Gen. & Switchyard Modernization Substations	To improve the SAIFI and SAIDI metrics PREPA will need to modernize and hardened the equipment at multiple distribution and transmission substations throughout the island. In addition, the Integrated Resource Plan and Grid Constraint studies identified the need to build multiple new transmission lines to improve grid resiliency. The addition of these new transmission lines will require substation expansions to accommodate the required equipment for the line terminals. The objective of this project is to plan the modernization and hardening of these substations to bring to industry standards.	2028	$6.02	Section III C

Buildings – Long-Term (2028-2030+)

Table 4.25 – Long-Term Buildings Projects

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Toa Alta Improvement and Construction	In response to damage caused by high winds, heavy wind-driven rain, wind-blown debris, and run-off during Hurricane María, the objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes to bring the Toa Alta Improvement and Construction complex into proper working order to provide adequate and reliable service in the region.	2030 +	$2.40	Section III C
San Juan-Santurce Building Complex	In response to damage caused by high winds, heavy wind-driven rain, wind-blown debris, and run-off during Hurricane María, the objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes to bring the San Juan Santurce Building complex into proper working order to provide adequate and reliable service in the region.	2030 +	$2.40	Section III C
Santa Isabel ESC & Commercial Office	In response to damage caused by high winds, heavy wind-driven rain, wind-blown debris, and run-off during Hurricane María, the objective of this project is to repair and/or replace the damaged site amenities, roofs, equipment, and finishes to bring the Santa Isabel Electric Service Center and Commercial Office into proper working order to provide adequate and reliable service in the region. This includes the site and seven buildings associated with the Santa Isabel Electric Service Center and Commercial Office.	2028	$0.31	Section III C

VI. PROJECT MILESTONE TIMING

G. Timing Assumptions

As is the case regarding the identification and prioritization of projects, the estimation of project milestone timing is based on the best information available to PREPA at the time of plan development.

Recognizing that PREPA does not yet have all necessary detail to develop detailed plans for its infrastructure projects and have clarity on milestone timing, COR3 and FEMA have identified this plan as a "living document," one that requires update and resubmission every 90 days after initial submittal.

The estimated timing of projects in PREPA's 10-Year Infrastructure Plan will be impacted by many different factors including, but not limited to, regulatory requirements and stakeholder input, improved clarity on project requirements and approach, project review and permitting processes, the availability of both labor and material resources to execute on project design and construction tasks, and potential future disaster events impacting the island. It is expected that PREPA's 10-Year Infrastructure Plan, including estimated project milestone timing, will require revision as part of these regular plan updates.

Regulatory requirements include future updates to the IRP or rulings from PREB that impact infrastructure investment projects or priorities. Stakeholder inputs include feedback on the initial plan and subsequent updates from COR3, FEMA, FOMB, LUMA, and others that may impact the timing of projects in the plan.

It is expected that increased clarity on project requirements and approach provided from current and future engineering studies as well as the completion of 30% A/E design work will result in updates to project approach and milestone timing estimates. Design work will be impacted by the development of PREPA-specific design standards, which are expected to be completed in early 2021. In addition, design work and project approach will be impacted by the collection of as-built/record drawings, the development of transmission line PLS-CADD (Power Line Systems – Computer Aided Design and Draft) models, the selection of distribution design software, asset management planning, and document control requirements for the work. Lastly, as many projects in the infrastructure portfolio are impacted by, or impact other projects, changes to the approach or timing of a single project may impact multiple other projects.

Another set of milestone timing assumptions and potential driver of milestone timing changes are around approval and permitting processes. These include uncertainty about the amount of time required from project submission to completion of review and receipt of approval from COR3 and FEMA. Specifically, the timing for environmental and remediation permits for each project will depend upon the type of project, its location, and

potential impacts on environmental/social receptors including air, water, wetlands, natural resources, and cultural and historical resources.

Lastly, milestone timing estimates assume the required labor and materials required to support the infrastructure plan will be available; however, shortages of either, even if temporary, may cause delays and necessitate adjustments to project milestone timing estimates.

H. Estimated Project Milestones

Each project has four standardized major milestones:

- Begin 30% Architecture and Engineering Design
- Submit Project to COR3 and FEMA for Review
- Begin Construction/Implementation
- Begin COR3 and FEMA Project Closeout

The tables below show, year by year, the workplan for major milestone initiation for the near-term projects in this plan. Mid and long-term project milestones are not included in this update of the plan but may be added back in a future update based on further review and refinement of project schedules.

Within each time period, projects are grouped first by milestone and then by asset category. Within each asset category projects are sequenced from largest to smallest investment amount.

Milestone initiation has been estimated at a quarterly level for years 2021-2023, to aid in work planning.

1. 2021 by Quarter

2021 Q2

Table 5.2 – 2021 Q2 Milestones

#	Project Name	Asset Category
2021 Q2 – Milestone: Begin 30% Architecture and Engineering Design		
1	New Black Start System at Costa Sur	Generation
2	Power Plants Storage Tanks/Fuel Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
3	Aguirre Unit 1 Major Overhaul (Necessary Maintenance)	
4	Renewable Generation Projects - Tranche 1 (1,000MWs of Generation Capacity / 500MWs of Minimum Battery Storage Capacity)	

#	Project Name	Asset Category
5	"Shovel Ready" Project - Xzerta Tec Solar (≈ 60 MWs)	
6	"Shovel Ready" Project - CIRO One Salinas (≈ 90 MWs)	
2021 Q2 – Milestone: Submit Project to COR3 and FEMA for Review		
N/A	None	N/A
2021 Q2 – Milestone: Begin Construction/Implementation		
1	Power Plants Storage Tanks/Fuel Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	Generation
2021 Q2 – Milestone: Begin COR3 and FEMA Project Closeout		
N/A	None	N/A

2021 Q3

Table 5.3 – 2021 Q3 Milestones

#	Project Name	Asset Category
2021 Q3 – Milestone: Begin 30% Architecture and Engineering Design		
1	Power Plants Units-Related Works and Repairs Projects (Necessary Maintenance - Next Three Fiscal Years)	Generation
2	Power Plants Other Repairs/Replacement Projects (Necessary Maintenance - Next Three Fiscal Years)	
3	Power Plants Electrical/Controls Projects (Necessary Maintenance - Next Three Fiscal Years)	
4	Power Plants Water Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
5	Aguirre Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
6	Cambalache Power Plant Repairs (Damages from Hurricanes - Federal Funded)	
7	Palo Seco Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
8	Jobos Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
9	Power Plants Fire Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
10	Cambalache Dike (Damages from Hurricanes - Federal Funded)	

#	Project Name	Asset Category
11	San Juan Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
12	Mayaguez Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
13	Daguao Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
14	Yabucoa Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
15	Vega Baja Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
16	Emergency Generation - Yabucoa Units	
17	Renewable Generation Projects - Tranche 2 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	
18	36100 - Dos Bocas - Monacillos	Transmission
19	37100 - Costa Sur - Acacias	
20	Existing 38 kV - Line 3000 Monacillos TC to Jucos TC	
21	36400 - Dos Bocas - Ponce	
22	Existing 38 kV - Line 100 and 200 Ponce TC to Jobos TC	
23	5400 - Rio Blanco HP - Daguao TC	
24	Existing 38 kV - Line 1500 Mayaguez GP to GOAB 1515	
25	Existing 115 kV - Line 36800 Palmer Fajardo to Sabana Llana	
26	Existing 38 kV - Line 1900 Dos Bocas HP to San Sebastian TC	
27	50100 - Cambalache - Manati	
28	36200 - Monacillos - Juncos	
29	Existing 38 kV - Line 2700 Victoria TC to Quebradillas Sect	
30	Existing 38 kV - Line 3600 Mnacillos TC to Martin Peña	
31	Existing 38 kV - Line 500 Ponce TC to Costa Sur SP	
32	37800 - Jobos - Caguas	
33	Existing 38 kV - Line 2400 Dos Bocas HP to America Apparel	
34	51300 - Ponce - Costa Sur	
35	4100 - Guaraguo TC - Comerio TC	

#	Project Name	Asset Category
36	Existing 115 kV - Line 36200 Fajardo to Rio Blanco	
37	37800 - Caguas - Monacillos	
38	Existing 38 kV - Line 4000 Comerio HP to Escuela Francisco Morales	
39	Existing 38 kV - Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	
40	Existing 38 kV - Line 11400 Barceloneta TC to Florida TO	
41	Existing 38 kV - Line 600 Caguas TC to Gautier Benitez Sect	
42	38000 - San Juan - Isla Grande (LOOP)	
43	39000 - Aguas Buenas - Caguas	
44	8200 - San Juan SP - Catano Sect	
45	Existing 38 kV - Line 9700 Palo Seco SP to Bay View Sect	
46	9500 - Palo Seco SP - Cantano Sect	
47	Existing 38 kV - Line 6700 Martin Peña TC to Villamar Sect	
48	Existing 38 kV - Line 13300 Bayamon TC to Plaza del Sol	
49	Existing 38 kV - Line 9100 Guaraguao TC to Bayamon Pueblo Sect	
50	1100 - Garzas 1 HP - Garzas 2 HP	
51	Existing 38 kV - Line 11100 Canovanas TC to GOAB 11115	
52	Fonalledas GIS Rebuilt 1401 1421	Distribution
53	Tapia GIS 1102 (Rebuilt)	Substations
54	Centro Medico 1 & 2 1327 & 1359	
55	Catano Modernization and Hardening	
56	Bayamon TC - BKRS Y1 - 1711 (Metalclad)	
57	Cachete 1526 (Metalclad)	
58	Caridad 1714 (Metalclad)	
59	Llorrens Torres 1106 (Metalclad)	
60	Taft 1105 (Metalclad)	
61	Viaducto TC 1100 (Metalclad)	
62	Rio Grande Estates 2306 (Elevated Control House)	

#	Project Name	Asset Category
63	Aguirre BKRS T018	
64	Costa Sur BKRS P001	
65	Vieques SUB 2501	
66	Culebra 3801	
67	Caguas TC BKRS 115kV	
68	MANATI TC BKR - T005	
69	Substation Minor Repairs - San Juan Region	
70	FAASt Aguadilla Electric Service Center (Building)	
71	FAASt Arecibo Regional Office Building (Building)	Buildings
72	FAASt Arecibo Electric Service Center (Building)	
73	Access Roads (Grouped)	Environmental
2021 Q3 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Fonalledas GIS Rebuilt 1401 1421	
2	Caguas TC BKRS 115kV	Substations
2021 Q3 – Milestone: Begin Construction/Implementation		
1	"Shovel Ready" Project - Xzerta Tec Solar (≈ 60 MWs)	
2	"Shovel Ready" Project - CIRO One Salinas (≈ 90 MWs)	Generation
2021 Q3 – Milestone: Begin COR3 and FEMA Project Closeout		
N/A	None	N/A

2021 Q4

Table 5.4 – 2021 Q4 Milestones

#	Project Name	Asset Category
2021 Q4 – Milestone: Begin 30% Architecture and Engineering Design		
1	Aguirre CC Main Power Transformer (Necessary Maintenance)	
2	New Thermal Generation Feasibility Study	Generation
3	Existing 38 kV - Line 3100 Monacillos TC to Daguao TC	Transmission

#	Project Name	Asset Category
4	Existing 38 kV - Line 2200 Dos Bocas HP to Dorado TC	
5	Existing 38 kV - Line 1200 Mayaguez GP to Yauco 2 HP	
6	Existing 38 kV - Line 8900 Monacillos TC to Adm. Tribunal Apelaciones	
7	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Distribution
8	Distribution Feeders - Short Term Group 1 - Ponce Region	
9	Distribution Feeders - Short Term Group 1 - San Juan Region	
10	Distribution Feeders - Short Term Group 1 - Arecibo Region	
11	Distribution Feeders - Short Term Group 1 - Bayamon Region	
12	Distribution Feeders - Short Term Group 1- Mayaguez Region	
13	Victoria TC 7008	Substations
14	Guaynabo Pueblo Substation	
15	Isla Grande 1101	
16	Berwind TC- MC - 1336	
17	Condado - MC - 1133	
18	Crematorio - MC - 1512	
19	Egozcue - MC - 1109	
20	Esc. Industrial M. Such - MC - 1423	
21	Parques y Recreos - MC - 1002	
22	Puerto Nuevo - MC - 1520	
23	Baldrich - MC - 1422	
24	Isla Grande GIS	
25	Tallaboa 5402	
26	Conquistador - CH	
27	Caparra 1911 & 1924	
28	Canas TC BKRS 115kV	
29	Salinas Urbano Minor Rprs - 4501	
30	Monacillo TC - Breakers	

#	Project Name	Asset Category
31	Jayuya Minor Rprs - 8301	
32	Sabana Grande Minor Rprs - 6501	
33	Substation Minor Repairs - Arecibo Regions	
34	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	IT/Telecom
35	GIS System	
36	Advanced Metering Infrastructure (AMI)	
37	Cybersecurity Program Implementation	
38	Energy Management System (EMS) (OT/Backoffice)	
39	FAN	
40	Infrastructure	
41	Meter & Automation Lab	
42	LMR Two-way radio P-25	
43	Microwave PTP	
44	Physical Security Assessment for Facilities	
45	SCADA RTU Replacement	
46	MPLS Network Deployment	
47	IT Corporate Network	
48	Monacillo Control Center	
49	Ponce Control Center	
50	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	Buildings
51	GIS System	
52	Advanced Metering Infrastructure (AMI)	
53	Cybersecurity Program Implementation	
54	Energy Management System (EMS) (OT/Backoffice)	
55	FAN	
56	Infrastructure	
57	Meter & Automation Lab	

#	Project Name	Asset Category
58	LMR Two-way radio P-25	
59	Microwave PTP	
60	Physical Security Assessment for Facilities	
2021 Q4 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Aguirre Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	Generation
2	Cambalache Power Plant Repairs (Damages from Hurricanes - Federal Funded)	
3	Palo Seco Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
4	Jobos Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
5	Cambalache Dike (Damages from Hurricanes - Federal Funded)	
6	San Juan Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
7	Mayaguez Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
8	Daguao Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
9	Yabucoa Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
10	Vega Baja Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
11	36100 - Dos Bocas - Monacillos	Transmission
12	37100 - Costa Sur - Acacias	
13	36400 - Dos Bocas - Ponce	
14	Existing 38 kV - Line 100 and 200 Ponce TC to Jobos TC	
15	5400 - Rio Blanco HP - Daguao TC	
16	Existing 115 kV - Line 36800 Palmer Fajardo to Sabana Llana	
17	50100 - Cambalache - Manati	
18	36200 - Monacillos - Juncos	
19	37800 - Jobos - Caguas	
20	51300 - Ponce - Costa Sur	

#	Project Name	Asset Category
21	4100 - Guaraguo TC - Comerio TC	
22	37800 - Caguas - Monacillos	
23	38000 - San Juan - Isla Grande (LOOP)	
24	8200 - San Juan SP - Catano Sect	
25	9500 - Palo Seco SP - Cantano Sect	
26	1100 - Garzas 1 HP - Garzas 2 HP	
27	Distribution Feeders - Short Term Group 1 - Carolina Region (Culebra 3801, Vieques Sub 2501 and Distribution)	Distribution
28	Tapia GIS 1102 (Rebuilt)	Substations
29	Centro Medico 1 & 2 1327 & 1359	
30	Catano Modernization and Hardening	
31	Guaynabo Pueblo Substation	
32	Bayamon TC - BKRS Y1 - 1711 (Metalclad)	
33	Cachete 1526 (Metalclad)	
34	Caridad 1714 (Metalclad)	
35	Llorrens Torres 1106 (Metalclad)	
36	Taft 1105 (Metalclad)	
37	Viaducto TC 1100 (Metalclad)	
38	Rio Grande Estates 2306 (Elevated Control House)	
39	Aguirre BKRS T018	
40	Costa Sur BKRS P001	
41	Vieques SUB 2501	
42	Canas TC BKRS 115kV	
43	Covadonga GIS Minor Rprs - 1011	
44	Culebra 3801	
45	MANATI TC BKR - T005	
46	Coamo PDS Minor Rprs - 4603	

#	Project Name	Asset Category
47	FAASt Aguadilla Electric Service Center (Building)	Buildings
48	FAASt Arecibo Regional Office Building (Building)	
49	FAASt Arecibo Electric Service Center (Building)	
50	Toa Baja Technical Services	
51	Palo Seco North & South	
52	Ponce Warehouse at Ponce ESC	
53	Ponce Calle Villa	
54	Access Roads (Grouped)	Environmental
2021 Q4 – Milestone: Begin Construction/Implementation		
1	Power Plants Other Repairs/Replacement Projects (Necessary Maintenance - Next Three Fiscal Years)	Generation
2	Aguirre Unit 1 Major Overhaul (Necessary Maintenance)	
3	Power Plants Electrical/Controls Projects (Necessary Maintenance - Next Three Fiscal Years)	
4	Power Plants Water Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
5	Power Plants Fire Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
6	Renewable Generation Projects - Tranche 1 (1,000MWs of Generation Capacity / 500MWs of Minimum Battery Storage Capacity)	
7	Icacos Dam	Dams and Hydro
2021 Q4 – Milestone: Begin COR3 and FEMA Project Closeout		
N/A	None	N/A

1. 2022 by Quarter

2022 Q1

Table 5.5 – 2022 Q1 Milestones

#	Project Name	Asset Category
2022 Q1 – Milestone: Begin 30% Architecture and Engineering Design		
1	Renewable Generation Projects - Tranche 3 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	Generation
2	Patillas Dam - Seismic Retrofit	Dams and Hydro
3	Distribution Feeders - Short Term Group 2 - Ponce Region	Distribution
4	Distribution Feeders - Short Term Group 2 - San Juan Region	
5	Distribution Feeders - Short Term Group 2 - Arecibo Region	
6	Distribution Feeders - Short Term Group 2 - Bayamon Region	
7	Distribution Feeders - Short Term Group 2 - Carolina Region	
8	Distribution Feeders - Short Term Group 2 - Mayaguez Region	
9	Santurce Planta (Sect) 1116	Substations
10	Covadonga GIS Minor Rprs - 1011	
11	Coamo PDS Minor Rprs - 4603	
12	Substation Minor Repairs - Bayamon Region	
13	Substation Minor Repairs - Mayaguez Region	
2022 Q1 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Emergency Generation - Yabucoa Units	Generation
2	Existing 115 kV - Line 36200 Fajardo to Rio Blanco	Transmission
3	Santurce Planta (Sect) 1116	Substations
4	Substation Minor Repairs - San Juan Region	
2022 Q1 – Milestone: Begin Construction/Implementation		
1	Aguirre Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	Generation
2	Cambalache Power Plant Repairs (Damages from Hurricanes - Federal Funded)	

#	Project Name	Asset Category
3	Palo Seco Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
4	Jobos Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
5	San Juan Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
6	Mayaguez Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
7	Daguao Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
8	Yabucoa Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
9	Vega Baja Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
2022 Q1 – Milestone: Begin COR3 and FEMA Project Closeout		
N/A	None	N/A

2022 Q2

Table 5.6 – 2022 Q2 Milestones

#	Project Name	Asset Category
2022 Q2 – Milestone: Begin 30% Architecture and Engineering Design		
1	Synchronous Condensers	Generation
2	Garzas Dam	Dams and Hydro
3	Distribution Feeders - Short Term Group 3 - San Juan Region	Distribution
4	Distribution Feeders - Short Term Group 3 - Bayamon Region	
5	Distribution Feeders - Short Term Group 3 - Carolina Region	
6	Distribution Feeders - Short Term Group 3 - Mayaguez Region	
7	Substation Minor Repairs - Ponce Region	Substations
2022 Q2 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Existing 38 kV - Line 3100 Monacillos TC to Daguao TC	
2	Existing 38 kV - Line 2200 Dos Bocas HP to Dorado TC	
3	Existing 38 kV - Line 3000 Monacillos TC to Jucos TC	

#	Project Name	Asset Category
4	Existing 38 kV - Line 1500 Mayaguez GP to GOAB 1515	Transmission
5	Existing 38 kV - Line 1200 Mayaguez GP to Yauco 2 HP	
6	Existing 38 kV - Line 1900 Dos Bocas HP to San Sebastian TC	
7	Existing 38 kV - Line 2700 Victoria TC to Quebradillas Sect	
8	Existing 38 kV - Line 3600 Mnacillos TC to Martin Peña	
9	Existing 38 kV - Line 500 Ponce TC to Costa Sur SP	
10	Existing 38 kV - Line 2400 Dos Bocas HP to America Apparel	
11	Existing 38 kV - Line 4000 Comerio HP to Escuela Francisco Morales	
12	Existing 38 kV - Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	
13	Existing 38 kV - Line 11400 Barceloneta TC to Florida TO	
14	Existing 38 kV - Line 8900 Monacillos TC to Adm. Tribunal Apelaciones	
15	Existing 38 kV - Line 600 Caguas TC to Gautier Benitez Sect	
16	39000 - Aguas Buenas - Caguas	
17	Existing 38 kV - Line 9700 Palo Seco SP to Bay View Sect	
18	Existing 38 kV - Line 6700 Martin Peña TC to Villamar Sect	
19	Existing 38 kV - Line 13300 Bayamon TC to Plaza del Sol	
20	Existing 38 kV - Line 9100 Guaraguao TC to Bayamon Pueblo Sect	
21	Existing 38 kV - Line 11100 Canovanas TC to GOAB 11115	
22	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Distribution
23	Distribution Feeders - Short Term Group 1 - Ponce Region	
24	Distribution Feeders - Short Term Group 1 - San Juan Region	
25	Distribution Feeders - Short Term Group 1 - Arecibo Region	
26	Distribution Feeders - Short Term Group 1 - Bayamon Region	
27	Distribution Feeders - Short Term Group 1- Mayaguez Region	
28	Victoria TC 7008	Substations
29	Isla Grande 1101	

#	Project Name	Asset Category
30	Berwind TC- MC - 1336	
31	Condado - MC - 1133	
32	Crematorio - MC - 1512	
33	Egozcue - MC - 1109	
34	Esc. Industrial M. Such - MC - 1423	
35	Parques y Recreos - MC - 1002	
36	Puerto Nuevo - MC - 1520	
37	Baldrich - MC - 1422	
38	Isla Grande GIS	
39	Tallaboa 5402	
40	Conquistador - CH	
41	Caparra 1911 & 1924	
42	Salinas Urbano Minor Rprs - 4501	
43	Monacillo TC - Breakers	
44	Jayuya Minor Rprs - 8301	
45	Sabana Grande Minor Rprs - 6501	
46	Substation Minor Repairs - Arecibo Regions	
47	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	IT/Telecom
48	GIS System	
49	Advanced Metering Infrastructure (AMI)	
50	Cybersecurity Program Implementation	
51	Energy Management System (EMS) (OT/Backoffice)	
52	FAN	
53	Infrastructure	
54	Meter & Automation Lab	
55	LMR Two-way radio P-25	

#	Project Name	Asset Category
56	Microwave PTP	
57	Physical Security Assessment for Facilities	
58	SCADA RTU Replacement	
59	MPLS Network Deployment	
60	IT Corporate Network	
61	Monacillo Control Center	
62	Ponce Control Center	
63	San Germán ESC	Buildings
64	Arecibo Region Miscellaneous Repairs	
65	Bayamon Region Miscellaneous Repairs	
66	Caguas Region Miscellaneous Repairs	
67	Carolina Region Miscellaneous Repairs	
68	Mayaguez Region Miscellaneous Repairs	
69	Ponce Region Miscellaneous Repairs	
2022 Q2 – Milestone: Begin Construction/Implementation		
1	Power Plants Units-Related Works and Repairs Projects (Necessary Maintenance - Next Three Fiscal Years)	Generation
2	Cambalache Dike (Damages from Hurricanes - Federal Funded)	
3	Renewable Generation Projects - Tranche 2 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	
4	Existing 38 kV - Line 3000 Monacillos TC to Jucos TC	Transmission
5	Existing 38 kV - Line 1500 Mayaguez GP to GOAB 1515	
6	Existing 38 kV - Line 1900 Dos Bocas HP to San Sebastian TC	
7	Existing 38 kV - Line 2700 Victoria TC to Quebradillas Sect	
8	Existing 38 kV - Line 3600 Mnacillos TC to Martin Peña	
9	Existing 38 kV - Line 500 Ponce TC to Costa Sur SP	
10	Existing 38 kV - Line 2400 Dos Bocas HP to America Apparel	

#	Project Name	Asset Category
11	Existing 38 kV - Line 4000 Comerio HP to Escuela Francisco Morales	
12	Existing 38 kV - Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	
13	Existing 38 kV - Line 11400 Barceloneta TC to Florida TO	
14	Existing 38 kV - Line 600 Caguas TC to Gautier Benitez Sect	
15	39000 - Aguas Buenas - Caguas	
16	Existing 38 kV - Line 9700 Palo Seco SP to Bay View Sect	
17	Existing 38 kV - Line 6700 Martin Peña TC to Villamar Sect	
18	Existing 38 kV - Line 13300 Bayamon TC to Plaza del Sol	
19	Existing 38 kV - Line 9100 Guaraguao TC to Bayamon Pueblo Sect	
20	Existing 38 kV - Line 11100 Canovanas TC to GOAB 11115	
21	Distribution Feeders - Short Term Group 1 - Carolina Region (Culebra 3801, Vieques Sub 2501 and Distribution)	Distribution
22	Tapia GIS 1102 (Rebuilt)	Substations
23	Centro Medico 1 & 2 1327 & 1359	
24	Catano Modernization and Hardening	
25	Bayamon TC - BKRS Y1 - 1711 (Metalclad)	
26	Cachete 1526 (Metalclad)	
27	Caridad 1714 (Metalclad)	
28	Llorrens Torres 1106 (Metalclad)	
29	Taft 1105 (Metalclad)	
30	Viaducto TC 1100 (Metalclad)	
31	Rio Grande Estates 2306 (Elevated Control House)	
32	Aguirre BKRS T018	
33	Costa Sur BKRS P001	
34	Vieques SUB 2501	
35	Culebra 3801	
36	MANATI TC BKR - T005	

#	Project Name	Asset Category
37	FAASt Aguadilla Electric Service Center (Building)	Buildings
38	FAASt Arecibo Regional Office Building (Building)	
39	FAASt Arecibo Electric Service Center (Building)	
40	Toa Baja Technical Services	
41	Palo Seco North & South	
42	Ponce Warehouse at Ponce ESC	
43	Ponce Calle Villa	
44	Access Roads (Grouped)	Environmental
2022 Q2 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Aguirre Unit 1 Major Overhaul (Necessary Maintenance)	Generation
2	Power Plants Fire Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
3	Icacos Dam	Dams and Hydro
4	1100 - Garzas 1 HP - Garzas 2 HP	Transmission
5	FAASt Arecibo Regional Office Building (Building)	Buildings

2022 Q3

Table 5.7 – 2022 Q3 Milestones

#	Project Name	Asset Category
2022 Q3 – Milestone: Begin 30% Architecture and Engineering Design		
1	Renewable Generation Projects - Tranche 4 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	Generation
2	Early Warning System (Dams) Project	Dams and Hydro
2022 Q3 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Distribution Feeders - Short Term Group 2 - Ponce Region	Distribution
2	Distribution Feeders - Short Term Group 2 - San Juan Region	
3	Distribution Feeders - Short Term Group 2 - Arecibo Region	
4	Distribution Feeders - Short Term Group 2 - Bayamon Region	

#	Project Name	Asset Category
5	Distribution Feeders - Short Term Group 2 - Carolina Region	
6	Distribution Feeders - Short Term Group 2 - Mayaguez Region	
7	Substation Minor Repairs - Bayamon Region	Substations
8	Substation Minor Repairs - Mayaguez Region	
2022 Q3 – Milestone: Begin Construction/Implementation		
1	Existing 115 kV - Line 36200 Fajardo to Rio Blanco	Transmission
2	Fonalledas GIS Rebuilt 1401 1421	Substations
3	Guaynabo Pueblo Substation	
4	Covadonga GIS Minor Rprs - 1011	
5	Coamo PDS Minor Rprs - 4603	
6	Substation Minor Repairs - San Juan Region	
2022 Q3 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Power Plants Electrical/Controls Projects (Necessary Maintenance - Next Three Fiscal Years)	Generation
2	Power Plants Water Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
3	"Shovel Ready" Project - Xzerta Tec Solar (≈ 60 MWs)	
4	"Shovel Ready" Project - CIRO One Salinas (≈ 90 MWs)	
5	37800 - Caguas - Monacillos	Transmission
6	8200 - San Juan SP - Catano Sect	
7	9500 - Palo Seco SP - Cantano Sect	
8	Vieques SUB 2501	Substations
9	Culebra 3801	
10	MANATI TC BKR - T005	

2022 Q4

Table 5.8 – 2022 Q4 Milestones

#	Project Name	Asset Category
2022 Q4 – Milestone: Begin 30% Architecture and Engineering Design		

#	Project Name	Asset Category
1	Mobile Emergency Generation - Remaining Peaking Capacity (contingent upon systems needs and PREB's review and approval)	Generation
2	Rio Blanco Penstock	Dams and Hydro
3	Toro Negro 2 Penstock	
4	Toro Negro Hydroelectric System Connection (4)	
5	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
2022 Q4 – Milestone: Submit Project to COR3 and FEMA for Review		
N/A	None	N/A
2022 Q4 – Milestone: Begin Construction/Implementation		
1	Aguirre CC Main Power Transformer (Necessary Maintenance)	Generation
2	Renewable Generation Projects - Tranche 3 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	
3	Existing 38 kV - Line 3100 Monacillos TC to Daguao TC	Transmission
4	Existing 38 kV - Line 2200 Dos Bocas HP to Dorado TC	
5	Existing 38 kV - Line 3000 Monacillos TC to Jucos TC	
6	Existing 38 kV - Line 1500 Mayaguez GP to GOAB 1515	
7	Existing 38 kV - Line 1200 Mayaguez GP to Yauco 2 HP	
8	Existing 38 kV - Line 1900 Dos Bocas HP to San Sebastian TC	
9	Existing 38 kV - Line 2700 Victoria TC to Quebradillas Sect	
10	Existing 38 kV - Line 3600 Mnacillos TC to Martin Peña	
11	Existing 38 kV - Line 500 Ponce TC to Costa Sur SP	
12	Existing 38 kV - Line 2400 Dos Bocas HP to America Apparel	
13	Existing 38 kV - Line 4000 Comerio HP to Escuela Francisco Morales	
14	Existing 38 kV - Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	
15	Existing 38 kV - Line 11400 Barceloneta TC to Florida TO	
16	Existing 38 kV - Line 8900 Monacillos TC to Adm. Tribunal Apelaciones	
17	Existing 38 kV - Line 600 Caguas TC to Gautier Benitez Sect	
18	39000 - Aguas Buenas - Caguas	

#	Project Name	Asset Category
19	Existing 38 kV - Line 9700 Palo Seco SP to Bay View Sect	
20	Existing 38 kV - Line 6700 Martin Peña TC to Villamar Sect	
21	Existing 38 kV - Line 13300 Bayamon TC to Plaza del Sol	
22	Existing 38 kV - Line 9100 Guaraguao TC to Bayamon Pueblo Sect	
23	Existing 38 kV - Line 11100 Canovanas TC to GOAB 11115	
24	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Distribution
25	Distribution Feeders - Short Term Group 1 - Ponce Region	
26	Distribution Feeders - Short Term Group 1 - San Juan Region	
27	Distribution Feeders - Short Term Group 1 - Arecibo Region	
28	Distribution Feeders - Short Term Group 1 - Bayamon Region	
29	Distribution Feeders - Short Term Group 1- Mayaguez Region	
30	Victoria TC 7008	Substations
31	Isla Grande 1101	
32	Berwind TC- MC - 1336	
33	Condado - MC - 1133	
34	Crematorio - MC - 1512	
35	Egozcue - MC - 1109	
36	Esc. Industrial M. Such - MC - 1423	
37	Parques y Recreos - MC - 1002	
38	Puerto Nuevo - MC - 1520	
39	Baldrich - MC - 1422	
40	Isla Grande GIS	
41	Tallaboa 5402	
42	Caparra 1911 & 1924	
43	Salinas Urbano Minor Rprs - 4501	
44	Jayuya Minor Rprs - 8301	
45	Sabana Grande Minor Rprs - 6501	

#	Project Name	Asset Category
46	Substation Minor Repairs - Arecibo Regions	
47	San Germán ESC	Buildings
48	Arecibo Region Miscellaneous Repairs	
49	Bayamon Region Miscellaneous Repairs	
50	Caguas Region Miscellaneous Repairs	
51	Carolina Region Miscellaneous Repairs	
52	Mayaguez Region Miscellaneous Repairs	
53	Ponce Region Miscellaneous Repairs	
2022 Q4 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Aguirre Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	Generation
2	Cambalache Power Plant Repairs (Damages from Hurricanes - Federal Funded)	
3	Palo Seco Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
4	Jobos Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
5	San Juan Steam Plant Repairs (Damages from Hurricanes - Federal Funded)	
6	Mayaguez Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
7	Daguao Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
8	Yabucoa Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
9	Vega Baja Gas Plant Repairs (Damages from Hurricanes - Federal Funded)	
10	Renewable Generation Projects - Tranche 1 (1,000MWs of Generation Capacity / 500MWs of Minimum Battery Storage Capacity)	
11	Covadonga GIS Minor Rprs - 1011	Substations
12	Coamo PDS Minor Rprs - 4603	
13	FAASt Aguadilla Electric Service Center (Building)	Buildings
14	Access Roads (Grouped)	Environmental

2. 2023 by Quarter

2023 Q1

Table 5.9 – 2023 Q1 Milestones

#	Project Name	Asset Category
2023 Q1 – Milestone: Begin 30% Architecture and Engineering Design		
1	Renewable Generation Projects - Tranche 5 (500MWs of Generation Capacity / 125MWs of Minimum Battery Storage Capacity)	Generation
2	Diversion Canal and Forebay	Dams and Hydro
3	Main and Aguadilla Canal	
4	Rio Blanco Hydroelectric System Connection	
5	Rio Blanco 1, 2	
6	Guayabal Dam	
7	Juana Diaz Canal	
8	Icacos Dam	
2023 Q1 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Garzas Dam	Dams and Hydro
2023 Q1 – Milestone: Begin Construction/Implementation		
1	Emergency Generation - Yabucoa Units	Generation
2	Distribution Feeders - Short Term Group 2 - Ponce Region	Distribution
3	Distribution Feeders - Short Term Group 2 - San Juan Region	
4	Distribution Feeders - Short Term Group 2 - Arecibo Region	
5	Distribution Feeders - Short Term Group 2 - Bayamon Region	
6	Distribution Feeders - Short Term Group 2 - Carolina Region	
7	Distribution Feeders - Short Term Group 2 - Mayaguez Region	
8	Conquistador - CH	Substations
9	Canas TC BKRS 115kV	
10	Caguas TC BKRS 115kV	

#	Project Name	Asset Category
11	Monacillo TC - Breakers	
12	Substation Minor Repairs - Bayamon Region	
13	Substation Minor Repairs - Mayaguez Region	
2023 Q1 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Power Plants Units-Related Works and Repairs Projects (Necessary Maintenance - Next Three Fiscal Years)	Generation
2	Power Plants Other Repairs/Replacement Projects (Necessary Maintenance - Next Three Fiscal Years)	
3	Power Plants Storage Tanks/Fuel Systems Projects (Necessary Maintenance - Next Three Fiscal Years)	
4	50100 - Cambalache - Manati	Transmission
5	37800 - Jobos - Caguas	
6	51300 - Ponce - Costa Sur	
7	Existing 38 kV - Line 8900 Monacillos TC to Adm. Tribunal Apelaciones	
8	Fonalledas GIS Rebuilt 1401 1421	Substations
9	Centro Medico 1 & 2 1327 & 1359	
10	Guaynabo Pueblo Substation	
11	Tallaboa 5402	
12	Aguirre BKRS T018	
13	Costa Sur BKRS P001	
14	Caparra 1911 & 1924	
15	Salinas Urbano Minor Rprs - 4501	
16	Jayuya Minor Rprs - 8301	
17	Sabana Grande Minor Rprs - 6501	
18	Substation Minor Repairs - San Juan Region	

2023 Q2

Table 5.10 – 2023 Q2 Milestones

#	Project Name	Asset Category
2023 Q2 – Milestone: Begin 30% Architecture and Engineering Design		
1	Guajataca Dam - establish the phases here - Study/Assessment - Detailed Design - Procurement	Dams and Hydro
2	Moca Canal	
3	Dos Bocas 1, 2, 3	
4	Dos Bocas Dam	
5	Caonillas 1	
6	Yauco 1	
7	Matrullas Building	
8	Patillas Dam	
2023 Q2 – Milestone: Submit Project to COR3 and FEMA for Review		
1	New Black Start System at Costa Sur	Generation
2	Mobile Emergency Generation - Remaining Peaking Capacity (contingent upon systems needs and PREB's review and approval)	
3	Toro Negro Hydroelectric System Connection (4)	Dams and Hydro
2023 Q2 – Milestone: Begin Construction/Implementation		
1	Renewable Generation Projects - Tranche 4 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	Generation
2	Distribution Feeders - Short Term Group 3 - San Juan Region	Distribution
3	Distribution Feeders - Short Term Group 3 - Bayamon Region	
4	Distribution Feeders - Short Term Group 3 - Carolina Region	
5	Distribution Feeders - Short Term Group 3 - Mayaguez Region	
6	Santurce Planta (Sect) 1116	Substations
7	Substation Minor Repairs - Ponce Region	
2023 Q2 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Aguirre CC Main Power Transformer (Necessary Maintenance)	Generation

#	Project Name	Asset Category
2	Cambalache Dike (Damages from Hurricanes - Federal Funded)	
3	Emergency Generation - Yabucoa Units	
4	Renewable Generation Projects - Tranche 2 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	
5	37100 - Costa Sur - Acacias	Transmission
6	Existing 115 kV - Line 36800 Palmer Fajardo to Sabana Llana	
7	36200 - Monacillos - Juncos	
8	4100 - Guaraguo TC - Comerio TC	
9	Existing 115 kV - Line 36200 Fajardo to Rio Blanco	
10	38000 - San Juan - Isla Grande (LOOP)	
11	Tapia GIS 1102 (Rebuilt)	Substations
12	Substation Minor Repairs - Arecibo Regions	

2023 Q3

Table 5.11 – 2023 Q3 Milestones

#	Project Name	Asset Category
2023 Q3 – Milestone: Begin 30% Architecture and Engineering Design		
1	Renewable Generation Projects - Tranche 6 (750MWs of Generation Capacity / 125MWs of Minimum Battery Storage Capacity)	Generation
2	Guajataca Reservoir	Dams and Hydro
3	Guerrero Reservoir	
4	Guineo Dam	
5	Matrullas Dam	
6	Toro Negro 1	
7	Patillas Canal	
8	Prieto Reservoir	
9	Yahucuas Reservoir	

#	Project Name	Asset Category
2023 Q3 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Caonillas 1	Dams and Hydro
2	Early Warning System (Dams) Project	
2023 Q3 – Milestone: Begin Construction/Implementation		
N/A	None	N/A
2023 Q3 – Milestone: Begin COR3 and FEMA Project Closeout		
1	36400 - Dos Bocas - Ponce	Transmission
2	Existing 38 kV - Line 100 and 200 Ponce TC to Jobos TC	
3	Catano Modernization and Hardening	Substations
4	Rio Grande Estates 2306 (Elevated Control House)	
5	Conquistador - CH	
6	Canas TC BKRS 115kV	
7	Caguas TC BKRS 115kV	
8	Monacillo TC - Breakers	
9	Substation Minor Repairs - Bayamon Region	
10	Substation Minor Repairs - Mayaguez Region	
11	San Germán ESC	Buildings
12	Arecibo Region Miscellaneous Repairs	
13	Bayamon Region Miscellaneous Repairs	
14	Caguas Region Miscellaneous Repairs	
15	Carolina Region Miscellaneous Repairs	
16	Mayaguez Region Miscellaneous Repairs	
17	Ponce Region Miscellaneous Repairs	

2023 Q4

Table 5.12 – 2023 Q4 Milestones

#	Project Name	Asset Category
2023 Q4 – Milestone: Begin 30% Architecture and Engineering Design		
N/A	None	N/A
2023 Q4 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Dos Bocas Dam	Dams and Hydro
2	Rio Blanco 1, 2	
3	Toro Negro 2 Penstock	
4	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
5	Patillas Dam - Seismic Retrofit	
2023 Q4 – Milestone: Begin Construction/Implementation		
1	Emergency Generation - Yabucoa Units	Generation
2	Renewable Generation Projects - Tranche 5 (500MWs of Generation Capacity / 125MWs of Minimum Battery Storage Capacity)	
3	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	IT/Telecom
4	GIS System	
5	Advanced Metering Infrastructure (AMI)	
6	Cybersecurity Program Implementation	
7	Energy Management System (EMS) (OT/Backoffice)	
8	FAN	
9	Infrastructure	
10	Meter & Automation Lab	
11	LMR Two-way radio P-25	
12	Microwave PTP	
13	Physical Security Assessment for Facilities	
14	SCADA RTU Replacement	
15	MPLS Network Deployment	

#	Project Name	Asset Category
16	IT Corporate Network	
17	Monacillo Control Center	
18	Ponce Control Center	
2023 Q4 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Renewable Generation Projects - Tranche 3 (500MWs of Generation Capacity / 250MWs of Minimum Battery Storage Capacity)	Generation
2	Existing 38 kV - Line 3000 Monacillos TC to Jucos TC	Transmission
3	Existing 38 kV - Line 1500 Mayaguez GP to GOAB 1515	
4	Existing 38 kV - Line 1200 Mayaguez GP to Yauco 2 HP	
5	Existing 38 kV - Line 1900 Dos Bocas HP to San Sebastian TC	
6	Existing 38 kV - Line 2700 Victoria TC to Quebradillas Sect	
7	Existing 38 kV - Line 3600 Mnacillos TC to Martin Peña	
8	Existing 38 kV - Line 500 Ponce TC to Costa Sur SP	
9	Existing 38 kV - Line 2400 Dos Bocas HP to America Apparel	
10	Existing 38 kV - Line 4000 Comerio HP to Escuela Francisco Morales	
11	Existing 38 kV - Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	
12	Existing 38 kV - Line 11400 Barceloneta TC to Florida TO	
13	Existing 38 kV - Line 600 Caguas TC to Gautier Benitez Sect	
14	39000 - Aguas Buenas - Caguas	
15	Existing 38 kV - Line 9700 Palo Seco SP to Bay View Sect	
16	Existing 38 kV - Line 6700 Martin Peña TC to Villamar Sect	
17	Existing 38 kV - Line 13300 Bayamon TC to Plaza del Sol	
18	Existing 38 kV - Line 9100 Guaraguao TC to Bayamon Pueblo Sect	
19	Existing 38 kV - Line 11100 Canovanas TC to GOAB 11115	
20	Santurce Planta (Sect) 1116	Substations
21	Substation Minor Repairs - Ponce Region	

VII. PROJECT AND PORTFOLIO MANAGEMENT APPROACH

Leading practice, in the utility industry, and in industries in general is to govern and oversee projects across the entire enterprise as a portfolio of projects. To affect this, PREPA's Program Management Office (PMO) directorate and LUMA's Capital Programs organization is implemented comprehensive Enterprise Project Management (EPM) programs. Although managed separately, these programs are based on leading project management practices and standards and meet federal and other regulatory requirements.

EPM defines and standardizes the phases of the project, from initiation through close-out and spells out the requirements and accountabilities for project management, reporting and controls within each phase.

Figure 6.1 – FEMA Technical Review

WALLA WALLA COST ENGINEERING

CENTER OF EXPERTISE

COST ESTIMATE REVIEW VALIDATION STATEMENT

For FEMA Project No: DR-4339-PR

FEMA Project Title: Puerto Rico Energy and Power Authority – PREPA

Fixed-Cost Estimate Validation

The Walla Walla District Cost Engineering Center of Expertise (Cost MCX) team, has been established as the third-party Independent Expert Panel (IEP) to validate cost estimates for Public Assistance projects that are submitted for review. Also, in accordance with Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work, FEMA DR-4339-PR, February 10, 2020.

It remains the responsibility of the Applicant and FEMA to implement effective project-management controls and implementation procedures, including risk management, throughout the life of the project, per FEMA guidelines.

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Chief, Cost Engineering MCX
Walla Walla District

US Army Corps of Engineers®

Date: 14 September 2020

EPM also formalizes and standardizes enterprise governance and oversight over the portfolio of all projects, incorporating leading practices for portfolio management. This includes how projects are justified and authorized as well as ongoing, centralized transparency and oversight over project execution.

To enable this an information system which serves as a single source of the truth for project objectives, costs, benefits and performance is being implemented, also a leading practice.

EPM strengthens PREPA's and LUMA's capability to properly manage FEMA funds and meet FEMA guidelines for effective project management controls and implementation procedures throughout the life of the project.

The EPM program is comprised of the following major elements: (A) Strong Governance, (B) Standardized Project Management Process, (C) Centralized Information System, and (D) Project Controls.

Taken together, these EPM program major elements support PREPA compliance with FEMA guidelines.

Strong Governance

The PREPA and LUMA EPM programs manage the FEMA funded projects under a governance structure that includes:

- Strong governance and oversight, by senior executives, of all projects
- Project justification that is rigorous, documented, data-driven, standardized, and includes assessment of costs, benefits and alternative courses of action

- Project authorization that is grounded in a well-defined process with clear roles and responsibilities
- Centralized approvals and oversight so that projects work together as a cohesive portfolio of projects

Standardized Project Management Process

As defined by COR3, the federal grant lifecycle process is an end-to-end framework outlining the progression of phases and key requirements PREPA must complete to obtain, manage, and closeout Public Assistance funding sub-awards and projects.

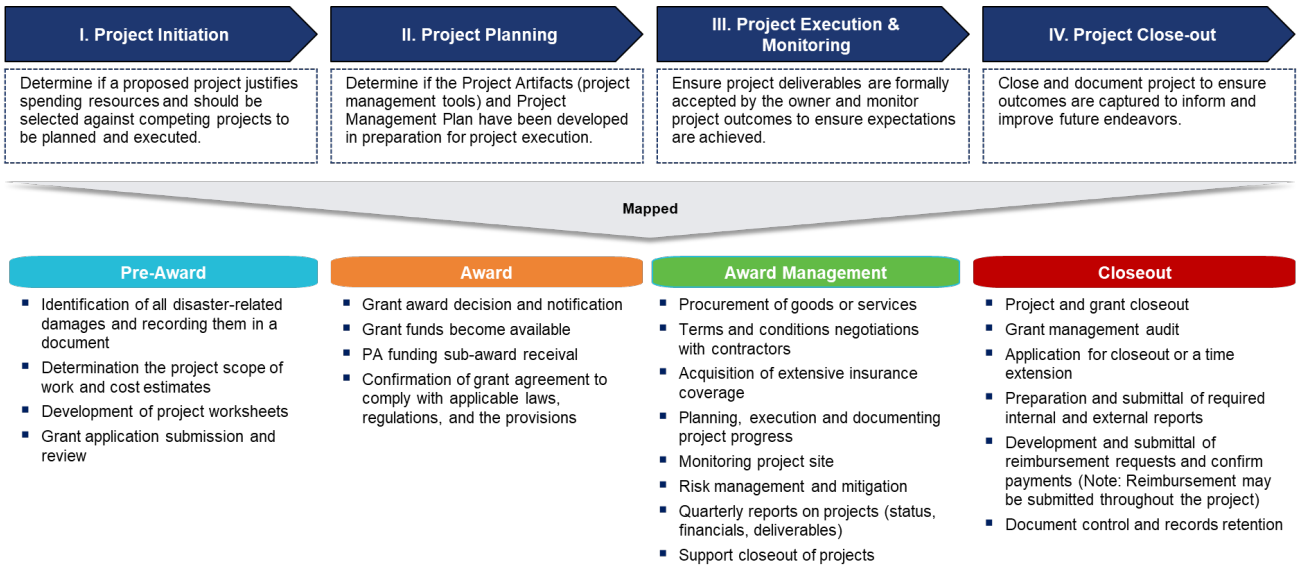
Figure 6.2 – COR3's Federal Grant Lifecycle

Both PREPA and LUMA ensure all projects are governed by a rigorous EPM process with clear accountabilities. Additionally, the process drives:

- Consistent standards based on leading practices for managing and governing all projects
- Holistic governance, oversight, and optimization of the portfolio of projects

The process has four phases for a project, each of which have defined deliverables and documentation required to enter the next phase. To ensure compliance with local and federal guidelines and regulations, key requirements and associated controls for the management of FEMA funds have been incorporated within the EPM process. Figure 6.3 below maps the PREPA's EPM process phases to COR3's Federal Grant Lifecycle and associated activities.

Figure 6.3 – PREPA's EPM Process Phases Mapped to Federal Grant Lifecycle



Note: LUMA's EPM process maps similarly to COR3's Federal Grant Lifecycle and associated activities.

Centralized Information System

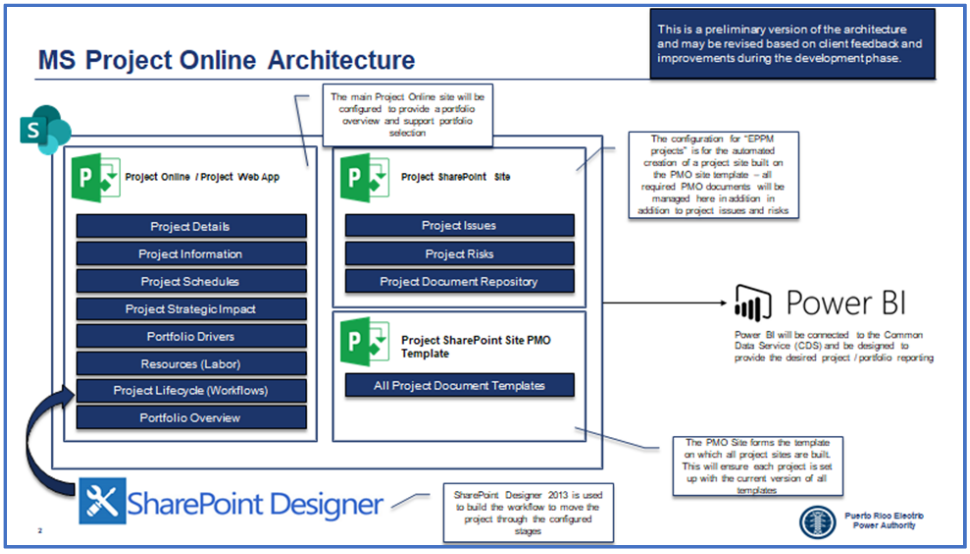
PREPA and LUMA have selected Microsoft Project Online as its Enterprise Project Management Information System. This system is in use by a number of leading utilities and is relatively easy for a broad population to learn and use.

The system functional architecture provides a variety of portfolio and project management features to enable management to maintain visibility around projects in each stage of the project management lifecycle from project initiation to project closeout. These system features include:

- Single source of the truth for each project to:
  - Create transparency for project performance, especially scope, schedule and budget
  - Enable accountability and performance management
  - Provide an integrated portfolio view of all projects so they can be authorized, governed and overseen as a portfolio
  - Ensure required records retention for project documentation
- Support for project selection with portfolio analysis, consistent with EPM and FEMA funding process
- Automates portfolio approval workflows configured to each stage in the project lifecycle to strengthen controls and improve efficiency

A high-level diagram of the system functional architecture can be found in Figure 6.4 below.

Figure 6.4 – EPM Centralized System Functional Architecture



Project Controls

The EPM program and process have incorporated the following to ensure PREPA and LUMA meet FEMA fund management guidelines:

- A set of quality management controls based on PREPA's a quality management system which was adapted from the ISO 9001 framework
- Effective project management controls and execution procedures, including risk management, based on leading practices
- FEMA grant and fund management controls to ensure compliance
- Leading practice executive portfolio dashboards, project reports, and monthly operating sequences

An example of standardized portfolio view report can be found below in Figure 6.5 below.

Figure 6.5 – Portfolio View Reporting – Milestones