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

IN RE: OPTIMIZATION PROCEEDING OF MINIGRID TRANSMISSION AND DISTRIBUTION INVESTMENTS	**CASE NO**.: NEPR-MI-2020-0016 **SUBJECT**: Orde for PREPA to file 10-Year Infrastructure Plan.

MOTION IN COMPLIANCE WITH ORDER ENTERED ON DECEMBER 30, 2020

COMES NOW the Puerto Rico Electric Power Authority through its legal representation and respectfully submits as follows:

I. INTRODUCTION

1. Yesterday, December 30, 2020, the Puerto Rico Energy Bureau of the Public Service Regulatory Board (the "Energy Bureau") entered a *Resolution and Order* communicating that it had become aware of a document titled *PREPA 10-Year Infrastructure Plan December 2020* (the "10-Year Plan") at the Puerto Rico Electric Power Authority (PREPA)'s website. The Energy Bureau mentions that the 10-Year Plan was apparently submitted by PREPA to the Federal Emergency Management Administration (FEMA). Further, the Energy Bureau entered several orders by which it seeks to have a true and exact copy of the 10-Year Plan submitted by PREPA and also, to hold a technical conference to discuss the alignment of the 10-Year Plan with the Integrated Resource Plan (IRP).

2. PREPA appreciates the Energy Bureau's interest in the 10-Year Plan and welcomes any public discussion of its contents and plans for implementation. The 10-Year Plan is the roadmap to secure the **$10.7 billion** funding that FEMA has obligated for the reconstruction and hardening of Puerto Rico's energy infrastructure. A true and exact copy of the 10-Year Plan that PREPA submitted to FEMA is available to the Energy Bureau and the People of Puerto Rico in PREPA's

website at https://aeepr.com/es-pr/Documents/20201207_PREPA%2010-Year%20Infrastructure%20Plan_vF.pdf and also, as attachment A to this motion.

3. PREPA also submits the *PREPA Supplemental 90-Day Plan* that was submitted to FEMA with the 10-Year Plan (the "90-day Plan"). Attachment B. The 90-Day Plan is a supplement to the 10-Year Plan that provides a summary overview of key next steps PREPA plans to take over the next 90 days to execute on its 10-Year Plan.

4. As an introduction to the importance of the 10-Year Plan, PREPA herein provides a summary of what is the 10-Year Plan, why PREPA developed the 10-Year Plan, and how the plans and projects that PREPA included in it are beneficial to Puerto Rico.

II. THE 10-YEAR PLAN

5. 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, PREPA worked closely with local and federal agencies, utility partners, contractors, and FEMA to restore electric service. 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. Puerto Rico's electric grid remains very vulnerable to future catastrophic events. As it is well known, 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 to rebuild Puerto Rico's electric system. As a part of this plan, a funding obligation of **$10.7 billion** was earmarked for PREPA to repair and/or replace its electrical systems including thousands of miles of transmission and distribution lines, electrical substations, power generation systems, office buildings, and other grid improvements under FEMA's Public Assistance Alternative

Procedures, pursuant to Section 428 of the Stafford Act. FEMA and Puerto Rico's Central Office for Recovery, Reconstruction and Resiliency ("COR3") requested from PREPA a work plan to be named the 10-Year Infrastructure Plan, to be submitted within 90 days of the funding obligation announcement. This plan is a requirement for PREPA to be eligible to receive the $10.7 billion funding obligation. As part of the requirements, the 10-Year Plan must outline PREPA's proposed investments in Puerto Rico's electric systems over the next 10 years.

6. To satisfy this requirement, PREPA developed the 10-Year Plan and submitted it for FEMA's review and consideration on December 7, 2020. The 10-Year Plan is a thorough roadmap that provides an overview of PREPA's infrastructure investment strategy; the context for the selection of projects included in the plan; a prioritized list of the 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 therein. Although the plan is only required by COR3 and FEMA to address PREPA's plans for the 428-obligated funds, PREPA took the approach of developing a strategy that includes all planned infrastructure investments regardless of funding source. This was done to provide a holistic view of the work to be performed on PREPA's system and a view of how the 428 funds will support PREPA's overall infrastructure investment strategy and approach. Projects included in the 10-Year Plan 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.

7. The 10-Year Plan is not a straitjacket to PREPA's futures plans. It is a live document that allows for the incorporation of changes as PREPA deems necessary. PREPA is required to update

and resubmit any revision to the 10-Year Plan to COR3 and FEMA every 90 days after the initial submission.

8. As the Energy Bureau is aware, in June 2019, PREPA submitted Revision 2 of the IRP, which provided recommendations for modifications and additions to PREPA's energy generating resources for a 20-year period, laying out the foundation for PREPA's transformation goals. PREPA's IRP was not exclusively designed to achieve the most economical approach to meeting electrical needs in Puerto Rico; instead, the IRP focused on creating a plan that was in line with PREPA's Vision, as adopted by PREPA's Governing Board, and addressed PREPA's aging generation fleet, achieved a reduction in generation costs, achieved compliance with the mandated Renewable Portfolio Standard (RPS), and shifted to a decentralized generation system.

9. The Energy Bureau reviewed the IRP plan and issued its *Final Resolution and Order on the Puerto Rico Electric Power Authority Integrated Resource Plan* on August 24, 2020, providing detailed findings, conclusions, and orders to PREPA.[1] On its Order, THE ENERGY BUREAU rejected the plan proposed in the IRP, known as the Energy System Modernization (ESM) Plan, as being the Preferred Resource Plan in part because said plan was not selected based on a Net Present Value Revenue Requirements analysis as required in Regulation 9021.

10. Key elements of the "Modified Action Plan" mandated by THE ENERGY BUREAU include: i) increased deployment of solar photovoltaic (PV) and battery resources as compared to PREPA's IRP proposal, ii) retirement of PREPA's oil-fired plants (Aguirre Steam unit 1 & 2, Palo Seco Steam units 1-4, and San Juan Steam units 7-10) over the next five years, iii) rejection of wholesale replacement of the eighteen existing gas turbine peaking and black starting units with

[1] *In Re: Review of the Puerto Rico Electric Power Authority Integrated Resource Plan*, case no. CEPR-2018-AP-0001.

new gas turbines, and iv) rejection of the addition of a new gas-fired combined-cycle power plant at Palo Seco.

11. To understand system impacts that would result from the implementation of the "Modified Action Plan", PREPA engaged Sargent & Lundy (S&L) to perform a Renewable Energy Integration Study[2] and develop a 10-Year Thermal Generation Plan[3] covering retirements, additions, and conversions to PREPA's generation fleet. Key findings and recommendations from these studies are presented in the following sections.

III. RENEWABLES INTEGRATION

12. The Integration Study assesses the capability of PREPA's power grid to accommodate increased levels of inverter-based generation and storage capacity. The current state, performance, and condition of the electrical generation and transmission and distribution (T&D) systems within Puerto Rico, as compared to reliability standards from the North American Electric Reliability Corporation (NERC), have all been found to be below acceptable thresholds. The need for a hardened power grid become more apparent when interconnecting renewable energy. It is recommended that a full restoration and modernization of the transmission and distribution systems begin immediately so that the PREPA power grid can reliably accommodate a significant increase in renewable energy. These power grid improvements are scheduled to be implemented within the next ten years. However, PREPA is mandated to integrate renewables at a pace that enables it to meet the 20% RPS target by 2022 and the 40% RPS target by 2025.

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[2] The Renewable Energy Integration Study was submitted to the Energy Bureau under seal as attachment to the *Motion in Compliance with Order Submitting Final Procurement Plan and Associated Request for Proposal* filed on December 22, 2020, in the matter of *In Re: Implementation of the Puerto Rico Electric Power Authority Integrated Resource Plan and Modified Action Plan*, case no. NEPR-MI-2020-0012. The study was submitted under seal. Pursuant to the applicable laws and regulations, the Energy Bureau can take administrative knowledge of the study. However, to ease the review of all the relevant documents, the study is herein attached as Attachment C.

[3] PREPA will submit the Thermal Generation Plan once it is completed. It is expected that S&L will submit a final version on or before two (2) weeks. PREPA will submit it to the Energy Bureau once its completed.

13. The Energy Bureau's guidance for renewable integration calls for the procurement of 3,750 MW of renewable energy and 1,500 MW of energy storage resources within the next three and a half years. As more renewables come online, system impact and facility studies will determine the transmission projects and upgrades that are necessary for further renewable integration.

14. The maximum inverter-based renewable energy capacity that can be integrated to the system as it exists today is 650 MW total of utility scale generation, which includes both existing and new inverter-based renewable energy generation. This value is a 'system as-is' value today and does not include expected system upgrades or energy storage systems that will be incorporated in the near future.

15. There are additional considerations and challenges associated with integrating high levels of inverter-based generation from renewable energy sources and battery energy storage system (BESS) while maintaining or improving power grid reliability. Inverter-based generators are connected to the grid through an electronic interface and have different dynamic behavior compared to rotating generators. These challenges quickly become apparent when increasing renewable penetration in an islanded power grid such as Puerto Rico. For higher penetrations of inverter-based generation, the electrical grid strength (also known as short-circuit strength) at various locations across Puerto Rico will decline if interventions are not taken. Weak electrical grids are more susceptible to voltage collapse and system outages. Areas of the electrical grid can be strengthened with the addition of rotating machinery (including options such as synchronous condensers – rotating machines that support system strength, voltage, and inertia, but do not generate power) placed in weak electrical grid areas. In the future, grid forming inverter functionality may assist with strengthening the electrical grid. This solution is currently not widely used and is a rapidly advancing area of research in the energy industry. Grid strength challenges

are already being experienced in parts of the world such as South Australia, Ireland, and regions of Texas with high renewable penetration.

16. Rotating generation typically consists of a turbine-generator set, the rotating mass of which acts as a kinetic energy store during system disturbances. This energy arrests the decline of frequency during a system disturbance (for example, loss of a generator somewhere else in the system). Higher penetrations of inverter-based renewable generation, and subsequent loss of rotating generation, may lead to PREPA's power grid becoming more sensitive to large frequency variations caused by system contingencies, due to low electrical inertia of the system. Without proper mitigation, large frequency variations can lead to underfrequency load trips and outages across the PREPA grid. Mitigation may include addition of rotating machinery and utilizing fast frequency response functionality in solar PV, wind, and BESS inverters.

17. It is possible to operate a power system at very low or zero inertia, but examples of such systems are limited. For example, zero-inertia AC microgrids exist, but these systems are small in size – multiple orders of magnitude smaller than PREPA's system. Operating a larger power system with little to zero inertia requires further research and new approaches to maintaining grid frequency, many of which are being investigated by the energy industry now. For this reason, a 60% limit on instantaneous inverter-based generation levels is essential for the short and intermediate time frames, but not necessarily for the long term.

18. For the reasons previously explained, S&L made the following recommendations to PREPA:

- Intermediate-Term Maximum Instantaneous Inverter-Based Limit of 60%

  To address the challenges associated with low inertia in the power system, the instantaneous inverter-based generation (*i.e.*, solar PV, wind, and battery energy storage)

levels in Puerto Rico should not exceed 60% for the near to intermediate future. If instantaneous inverter-based generation levels are allowed to go above 60% there would not be sufficient electrical system inertia to maintain system frequency following a disturbance. This limit will help to mitigate the risk of system instability and load shedding as Puerto Rico installs more inverter-based generation. It should be noted that the 'instantaneous' limitation specifically refers to the amount of generation from inverter-based sources at a specific instance.

- Synchronous Condensers

  Synchronous condensers are rotating machines that support system strength, voltage, and inertia, but do not generate power. Adding synchronous condensers improves overall system performance, both from the perspective of grid inertia and grid strength. These machines will be needed to support Puerto Rico's rapid transition to renewable energy. The exact location, number, and size of synchronous condensers needed will be determined once PREPA better understands more details concerning the locations and sizes of new inverter-based resources. Also, the addition of synchronous condensers does not preclude the need for synchronous generation due to the fact that synchronous condensers cannot provide generation that may be needed during major storms or hurricanes.

- New Synchronous Generation

  Over 2,000 MW of legacy oil-fired generation and 450 MW of coal-fired generation is scheduled to be retired in Puerto Rico between now and 2027. New, highly efficient, thermal generation units, with rapid startup and ramp rate capabilities are needed to both facilitate the successful retirement of these legacy generation units and to provide electrical system stability / reliability as renewable energy generators are installed to help meet RPS

targets. Without approximately 600 - 700 MW of new, state-of-the-art, flexible, thermal generation equipment, it will be difficult to maintain the minimum inertia needed to avoid power grid reliability issues as Puerto Rico transitions heavily towards renewable energy generation. In addition to supporting the grid, new thermal generation equipment will also help PREPA manage the interruption of generation from certain renewable energy resources due to cloud cover, tropical storms or hurricane events, in addition to helping PREPA manage any potential limitations on battery discharge durations. During major storms, this new thermal capacity could provide emergency generation, which is vital for the safety and security of the island's residents. Peaking generators, black start units, and a combined-cycle power plant in the San Juan area funded by FEMA 404 and 428 will help PREPA provide a reliable electrical system through Puerto Rico's ongoing transition to renewable energy.

IV. THERMAL GENERATION ADDITIONA. RETIREMENT AND CONVERSION PLAN

19. Given the state of the utility, initial efforts to improve the system as a whole, must focus on the retirement of generation facilities that are inefficient, not reliable, and costly to operate. Too many generation facilities are outdated—with initial commercial operation dates in the 1960's thru 1980. Not only are these plants beyond their useful service lives, but these legacy units cannot provide operators with the necessary flexibility and controls to operate with a larger percentage of renewable generation systems. As was previously explained, to facilitate the retirement of the outdated units, permit extensive renewable integration, and to address hazard mitigation stipulations from the US Government, it is necessary to integrate some new thermal generation facilities. It is important to note that PREPA is starting from sub-standard performance metrics; it

is imperative that transformation work is coupled with modern generation equipment that is able to support renewable projects rather than contribute to less reliable utility services.

20. With the recently obligated FEMA funds, PREPA now has significant funding to begin the mandated utility transformation process; however they must work within the FEMA frameworks to execute a handful of US Government funded generation projects that must specifically address hazard mitigation for the residents of Puerto Rico. A *10-Year Thermal Generation Addition, Retirement, and Conversion Plan* has been recently submitted to PREPA. It describes an optimal plan for this government funding. Given the complex and onerous set of mandates that have been established within Puerto Rico and the guidelines that must also be followed for the FEMA grants, choosing an effective generation path that satisfies all concerned parties is a challenge. PREPA must also proceed with generation solutions that are economically viable and support the future integration of renewable generation and energy storage facilities. Within the first quarter of 2021, S&L anticipates submitting the 10-Year Thermal Generation Plan to FEMA, which provides a conceptual solution based upon Phase 1 engineering studies required by the government grants. The recommendations if approved, should satisfy their requirements and more importantly, provide a modern generation platform for PREPA to launch plant retirements, reduce dependency on fuel oils, improve production costs, and make meaningful steps towards the required renewable integration work. This plan is not a replace-in-kind solution, but rather tailored to suit a new utility; it integrates dual-fuel small, rapid-start reciprocating engines coupled with modern gas turbine technology for peaking sites, and includes a new combined-cycle plant in San Juan.

V. CONCLUSION

21. All the information herein included will be further developed and explained in a presentation that will be submitted to the Energy Bureau on or before January 8, 2021. Moreover,

the 10-Year Plan will be thoroughly discussed during the January 11, 2021's technical conference as ordered by the Energy Bureau. PREPA's staff and advisors will be available during the technical conference to aid the discussion of the 10-Year Plan and explain the projects included in it and their importance. It is hereby reiterated that PREPA is appreciative of the Energy Bureau's interest in the project that is of the utmost important to PREPA, the hardening of the electric system to provide the citizens of Puerto Rico with the most reliable energy service possible and securing the **$10.7 billion** in FEMA funds to achieve and complete the task.

WHEREFORE, it is respectfully requested that the Energy Bureau takes notice of PREPA's compliance with the Resolution and Order entered on December 30, 2020.

Respectfully Submitted.

In San Juan Puerto Rico, this 31st day of December 2020.

s/ Katiuska Bolaños-Lugo
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Attachment A

FEMA

PREPA 10-Year Infrastructure Plan

December 2020

Puerto Rico Electric Power Authority

TABLE OF CONTENTS

I. 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 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 this 10-Year Infrastructure Plan and is submitting 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

PREPA's investment strategy for the 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) T&D Roadmap, Independent Engineer's Reports, and COR3's Grid 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 ensure all projects included in the plan align with PREPA's IRP and comply with all applicable 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* ▪ *Energy Management System (EMS)*	▪ *Renewables (e.g., solar and wind)* ▪ *Hydroelectric* ▪ *Battery Storage* ▪ *Peaking Units* ▪ *Flexible Dispatchable Generation*	▪ *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* ▪ *Emergency Power Generation Units*

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 in this plan. The sub-projects selected for the plan were consolidated into 256 larger projects.

The 256 projects in the plan are organized in eight distinct asset categories. Asset categories in the plan are based on the categorization approach used to reach the FEMA 428-funding obligation. PREPA retained the eight asset categories from that funding obligation and added one additional asset category, Environmental.

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

Table 1.2 – Summary of Asset Categories

Generation	Dams/Hydro	Transmission	Distribution
Includes new thermal and renewable generation, grid support centers, thermal retirements, emergency and "peaker" 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

Plan Overview

PREPA's 10-Year Infrastructure Plan includes approximately $11.8 billion in investment that is needed to rebuild and transform Puerto Rico's electric system, most of which qualifies for FEMA funding under its 428 and 404 mitigation programs. The $11.8 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 is to submit proposals for 406 funding with each of its 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 will submit proposals for 406 funding with each of its 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)	FEMA 406 ($M)	NME Funds ($M)	Estimated Total Cost[1] ($M)
Distribution	$4,387	$0	TBD	$0	$4,387
Transmission	$3,165	$0	TBD	$0	$3,165
Generation	$129	$853	TBD	$328	$1,311
Substations	$811	$0	TBD	$340	$1,151
Hydro, Dams, and Irrigation	$921	$0	TBD	$0	$921
IT and Telecommunications	$686	$0	TBD	$92	$778
Buildings	$63	$0	TBD	$0	$63
Environmental	$15	$0	TBD	$0	$15
Total	**$10,176**	**$853**	**TBD**	**$760**	**$11,789**

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 will seek to leverage funds from Community Development Block Grant Disaster Recovery (CDBG-DR) for the 10% cost share allocation.

Forecast spend 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 spend 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 Spend by Year and Asset Category ($ millions)

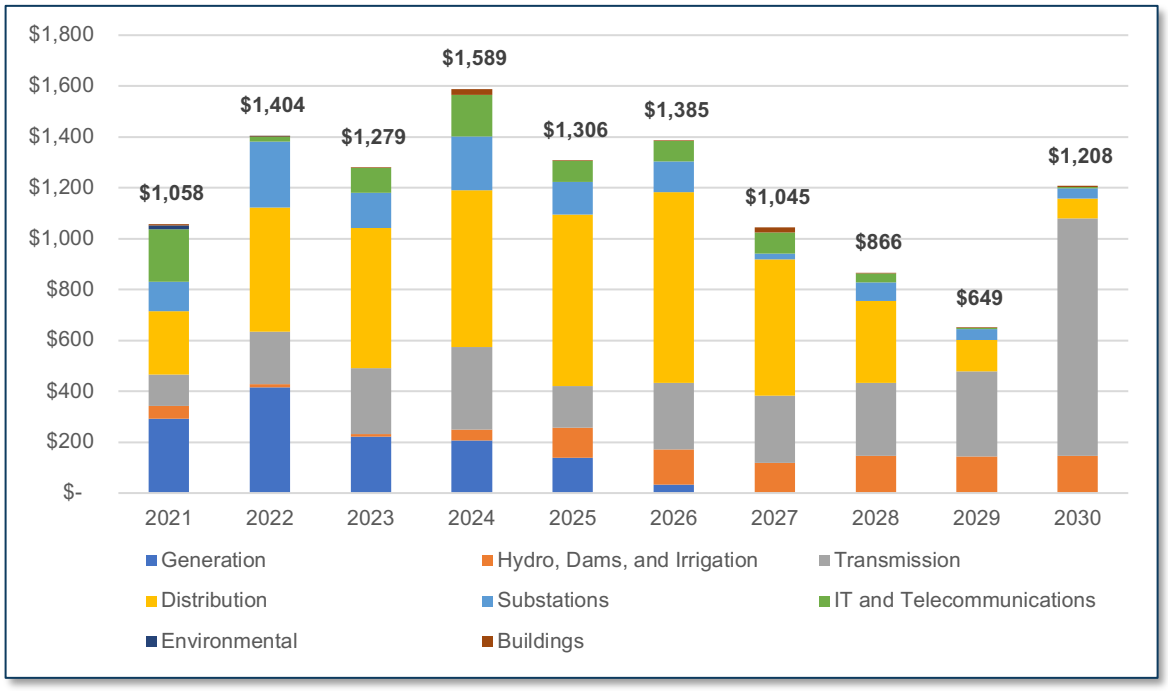
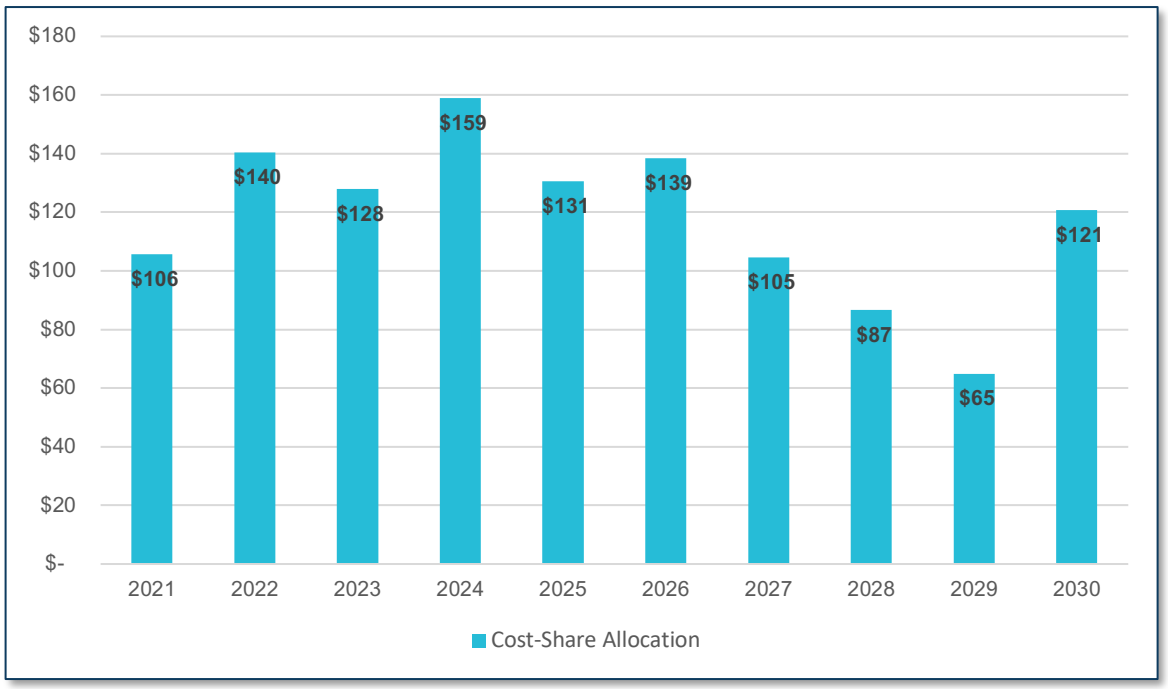


Figure 1.2 – Estimated Cost-Share Allocation by Year ($ millions)



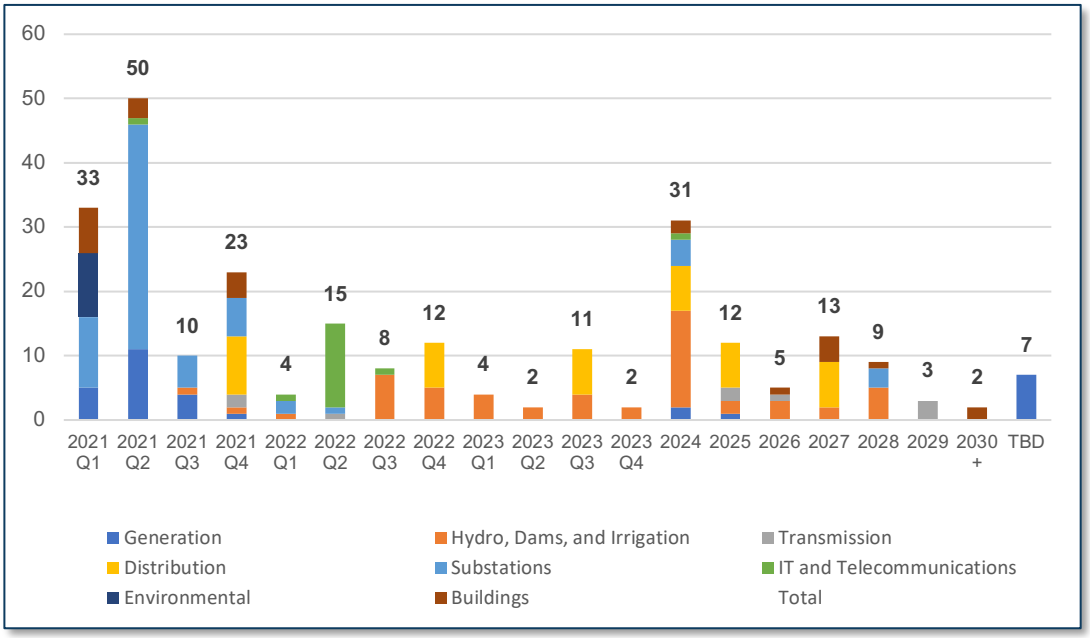
As discussed above, 256 projects were identified, prioritized, and included in the 10-Year Plan. Table 1.4 illustrates the distribution of these projects by asset category and by time horizon.

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
Substations	60	4	3	**67**
Hydro, Dams, and Irrigation	35	14	5	**54**
Distribution	30	14	0	**44**
Generation	27	4	0	**31**
Buildings	14	7	3	**24**
IT and Telecommunications	16	1	0	**17**
Environmental	10	0	0	**10**
Transmission	3	3	3	**9**
Total	**195**	**47**	**14**	**256**

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



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 195 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 $7.6 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.

A high proportion of the 10-Year Plan projects have been sequenced in the near-term time horizon for several reasons:

- It is PREPA's objective to deliver results as quickly as possible.
- Some projects already have completed preliminary engineering and are ready to proceed into the 30% A/E design phase.
- 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 many cases, demolition work, environmental remediation, right-of-ways, permits and approvals must be carried out before the actual project begins.

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

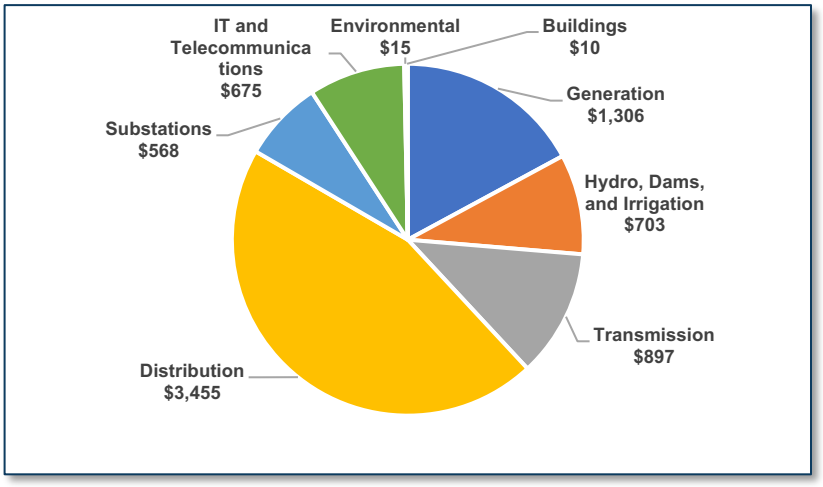


Table 1.5 – Near-Term (2021-2023), Notable Projects

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Generation	New Black Start Systems at Aguirre and at Costa Sur	$90.40	2021 Q1	2021 Q1
Generation	New Combined-Cycle Plant near San Juan	$572.40	2021 Q1	2021 Q3
Generation	Renewable Energy and Battery Storage Projects – Phase 1	TBD *(based on PPOAs)*	-	-
Generation	New Peaking Units	$280.80	2021 Q2	2021 Q3
Transmission	Harden and/or rebuild 12 Transmission Lines (≈ 237 mi) of 115 kV and 230 kV to conform with consensus-based codes and standards	$262.30	2021 Q1	2021 Q4
Transmission	Harden and/or rebuild 21 Transmission Lines (≈ 425 mi) of 38 kV to conform with consensus-based codes and standards	$419.65	2021 Q1	2021 Q4
Transmission	New build of 14 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	$215.00	2021 Q1	2022 Q2
Distribution	Distribution Automation – All Regions	TBD	2021 Q1	2021 Q4
Distribution	Smart Street Lighting – All Regions	$185.50	2021 Q2	2021 Q4
Distribution	Harden or underground initial set of 41 San Juan area Distribution Feeders (≈ 63.87 mi), including critical loads to conform with consensus-based codes and standards	$97.35	2021 Q4	2022 Q4
Distribution	Harden or underground an additional 53 San Juan-area Distribution Feeders in the mid-term priority category (≈ 80.27 mi), including critical loads to conform with consensus-based codes and standards	$160.47	2023 Q2	2024
Distribution	Harden or underground 23 Distribution Feeders (≈ 108.71 mi), including critical loads, in the Bayamón region to conform with consensus-based codes and standards	$126.35	2022 Q3	2023 Q3
Distribution	Harden or underground 20 Distribution Feeders (≈ 103.91 mi), including critical loads, in the Carolina region to conform with consensus-based codes and standards	$115.36	2022 Q3	2023 Q3
Distribution	Harden or underground 30 Distribution Feeders (≈ 166.73 mi), including critical	$243.36	2021 Q1	2021 Q4

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
	loads, in the Caguas region to conform with consensus-based codes and standards			
Distribution	Harden or underground 33 Distribution Feeders (≈ 144.56 mi), including critical loads, in the Arecibo region to conform with consensus-based codes and standards	$166.02	2022 Q3	2023 Q3
Distribution	Harden or underground 55 Distribution Feeders (≈ 209.27 mi), including critical loads, in the Ponce region to conform with consensus-based codes and standards	$249.75	2021 Q4	2022 Q4
Distribution	Harden or underground 57 Distribution Feeders (≈ 322.53 mi), including critical loads, in the Mayagüez region to conform with consensus-based codes and standards	$357.11	2022 Q3	2023 Q3
Substation	San Juan 115kV GIS	$64.60	2021 Q1	2021 Q1
Substation	Flooded Substations Hazard Mitigation (10 across the 7 PREPA regions)	$42.00	2021 Q4	2022 Q4
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 47 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 $3.1 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)

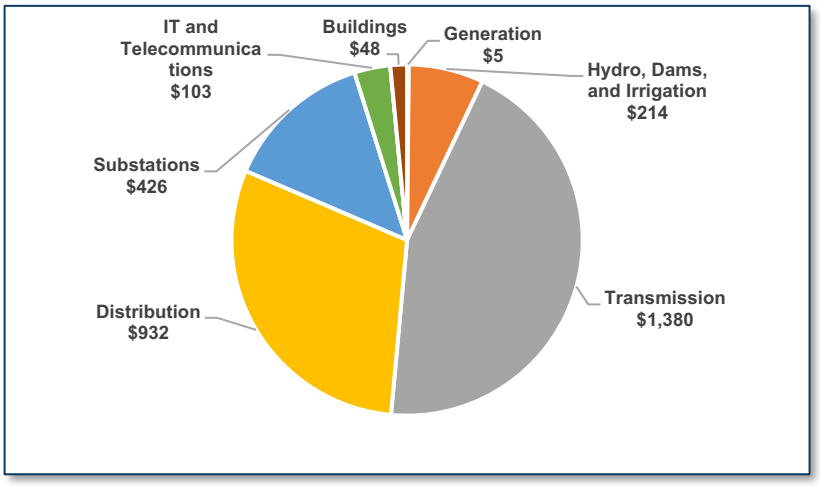


Table 1.6 – Mid-Term (2024-2027), Notable Projects

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Generation	Synchronous condensers	TBD	2024	2024
Transmission	Harden and/or rebuild 37 Transmission Lines (≈ 496 mi) of 115 kV and 230 kV to conform with consensus-based codes and standards	$548.60	2025	2025
Transmission	Harden and/or rebuild 40 Transmission Lines (≈ 511 mi) of 38 kV to conform with consensus-based codes and standards	$537.70	2025	2025
Transmission	New build of 16 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	$294.00	2024	2026
Distribution	Harden or underground 134 Distribution Feeders (≈ 134.39 mi), including critical loads, in the San Juan region to conform with consensus-based codes and standards	$248.59	2025	2025
Distribution	Harden or underground 29 Distribution Feeders (≈ 79.72 mi), including critical loads, in the Arecibo region to conform with consensus-based codes and standards	$115.08	2025	2025

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Distribution	Harden or underground 26 Distribution Feeders (≈ 38.66 mi), including critical loads, in the Ponce region to conform with consensus-based codes and standards	$70.85	2025	2025
Distribution	Harden or underground 32 Distribution Feeders (≈ 44.06 mi), including critical loads, in the Mayagüez region to conform with consensus-based codes and standards	$75.19	2025	2025
Substation	Grid Concern Substations – Modernize and hardened the equipment at multiple 9 distribution and 330 transmission substations	$204.00	2024	2024
Substation	Modernization & Hardening Substations – Modernize and hardened the equipment at multiple 96 distribution and 93 transmission substations, including 32 transmission line terminals	$93.50	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 14 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 $1.05 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)

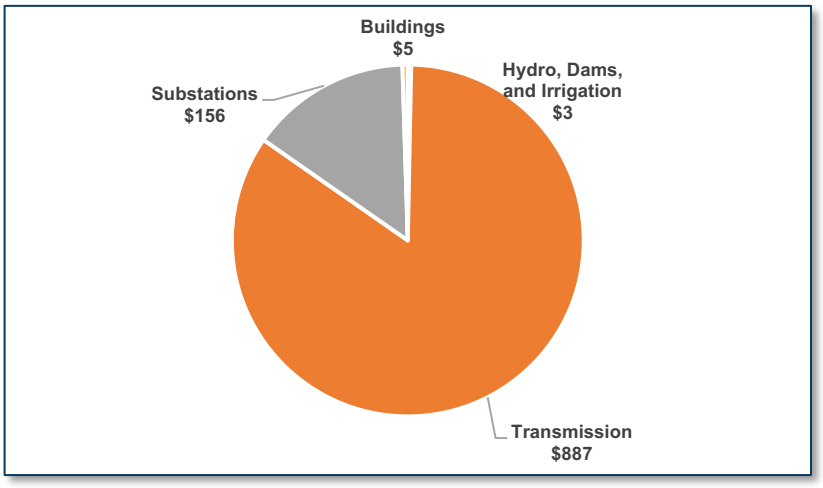


Table 1.7 – Long-Term (2028 and beyond), Notable Projects

Asset Category	Brief Description	Estimated Cost ($M)	Begin A&E Work	Submit SOW to FEMA
Transmission	Harden and/or rebuild 28 Transmission Lines (≈ 354 mi) of 115 kV and 230 kV to conform with consensus-based codes and standards	$422.65	2029	2029
Transmission	Harden and/or rebuild 86 Transmission Lines (≈ 345 mi) of 38 kV to conform with consensus-based codes and standards	$363.70	2029	2029
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 has implemented project management standards and controls in accord with leading practices.

PREPA is currently extending and expanding this and implementing an Enterprise Project Management (EPM) program.

This EPM program is 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.

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*

II. INTRODUCTION

The purpose of this document is to provide an overview of PREPA's 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 Bn 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.

PREPA's 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 PREPA submitting individual project funding requests and beginning 30% A/E design for 2021 projects. PREPA plans to begin requesting funding as soon as practicable, now that the initial version of this plan has been completed and submitted.

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 PREPA's 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'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 continues 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 will be updated on a quarterly basis. With this submittal, PREPA intends to execute a set of defined, effective, multi-faceted projects to transform Puerto Rico's electrical grid as described herein.

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

III. PREPA'S 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 Grid 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.*
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 Grid 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 a 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 ensure all projects included in the plan align with PREPA's IRP and comply with all applicable 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* ▪ *Energy Management System (EMS)*
Renewable Integration	*Support and enable the rapid and substantial increase of renewable generation and energy storage. Examples include:* ▪ *Renewables (e.g., solar and wind)* ▪ *Hydroelectric* ▪ *Battery Storage* ▪ *Peaking Units and Flexible Dispatchable Generation*
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* ▪ *Emergency Power Generation Units*

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

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 seamlessly integrate 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 RPS 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 300-400 MW Combined-Cycle Plant	▪ First and foremost, this new Combined-Cycle plant provides dependable source of generation for the metropolitan San Juan area in the event of another catastrophic event that curtails transmission from existing generation resources; planning is in process to integrate this plant with existing fuel systems, a new gas insulated substation (GIS) project, and a restored underground loop around the metropolitan area. ▪ With the anticipated influx of inverter-based (e.g., solar) power generation systems, this plant will provide reliable generation that can be dispatched at any time and contribute inertia, short-circuit strength, and other services that will be required in the system when more renewable generation facilities are incorporated.

Project	Enabling Factors

	▪ Mitigates the impacts of the retirement of many old generation units fired with heavy fuel oil in the metropolitan area.
	▪ Deploys a best-in-class design and the most efficient thermal facility on the island.
	▪ Together, with hardened plant systems, this new combined-cycle plant is anticipated to be the cornerstone of PREPA's transformation process, providing a robust power generation and delivery system across a wide range of operating conditions, including essential grid support for the planned renewable energy projects.
	▪ Qualifies for FEMA 404, hazard mitigation funding.
	  ▪ Refer to Sargent & Lundy's New Thermal
	  ▪ Generation Justification report for details of thermal plant retirements, additions, and conversions.

All-Source Renewables RFP	▪ Supports compliance with renewable energy goals ▪ Includes generation equipment and 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	▪ 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 ▪ Provides the utility with operational experience with battery storage systems and supports transition to a 100% renewable generation

Project	Enabling Factors
Emergency Generation Units	▪ Provides a safeguard for areas that are vulnerable to becoming disconnected from the grid when transmission infrastructure is damaged by extreme weather events ▪ 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 ▪ Qualifies for FEMA 404 hazard mitigation funding
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

Note: Refer to Sargent & Lundy's New Thermal Generation Justification report for details of thermal plant retirements, additions, and conversions.

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: 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.

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	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.

IV. PREPA'S PRIORITIZED INFRASTRUCTURE PROJECTS

A. Introduction

This section of PREPA's 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 PREPA's first standard milestone for projects in its 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 PREPA has sought 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 expects to provide additional details on these projects in a future update to the plan.

Lastly, in accordance with direction from COR3 and FEMA, PREPA will update this plan 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 each asset category contained in this plan and characterizes the types of projects found within each category:

Figure 4.1 – Asset Category Descriptions

GENERATION 	*Includes new thermal and renewable generation, grid support centers, thermal retirements, emergency and "peaker" 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 IRP. 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.

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. Dam and Hydro project prioritization was 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 intends to pursue a high proportion of its projects in the near-term for several reasons: 1) it is PREPA'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 consist largely of repairs of damages incurred during the 2017 hurricanes at several generating facilities. This includes all projects included in the application submitted under the FEMA 428 program. Priority will be given to remediating safety issues.

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.

In addition, new thermal generation planning, permitting, and basic engineering are planned to start the installation of units funded by both the FEMA 428 and 404 programs. 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). 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 repairing damages from sediment, storm debris, and erosion.

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 12 transmission lines (237 circuit miles).

There are also 14 230kV, 115kV, and 38kV new lines included in the plan in the near-term, 13 underground and 1 overhead. These projects will be further defined in Q1-2021 to determine the feasibility, benefits, and estimated costs.

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. From this assessment, 95 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.

Another 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 classified in the second tier.

Accordingly, the total number of feeders to be worked in the near-term is approximately 277.

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. In the case of feeders that have critical loads, the feeder will be constructed underground from the substation up to the critical load area. However, some points of interconnection to the remaining overhead previous backbone will be enabled to improve reliability and allow for quick service restoration in case of faults in the original line.

As part of the overall approach to distribution, PREPA 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

There are approximately 155 substations that 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 3. “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:

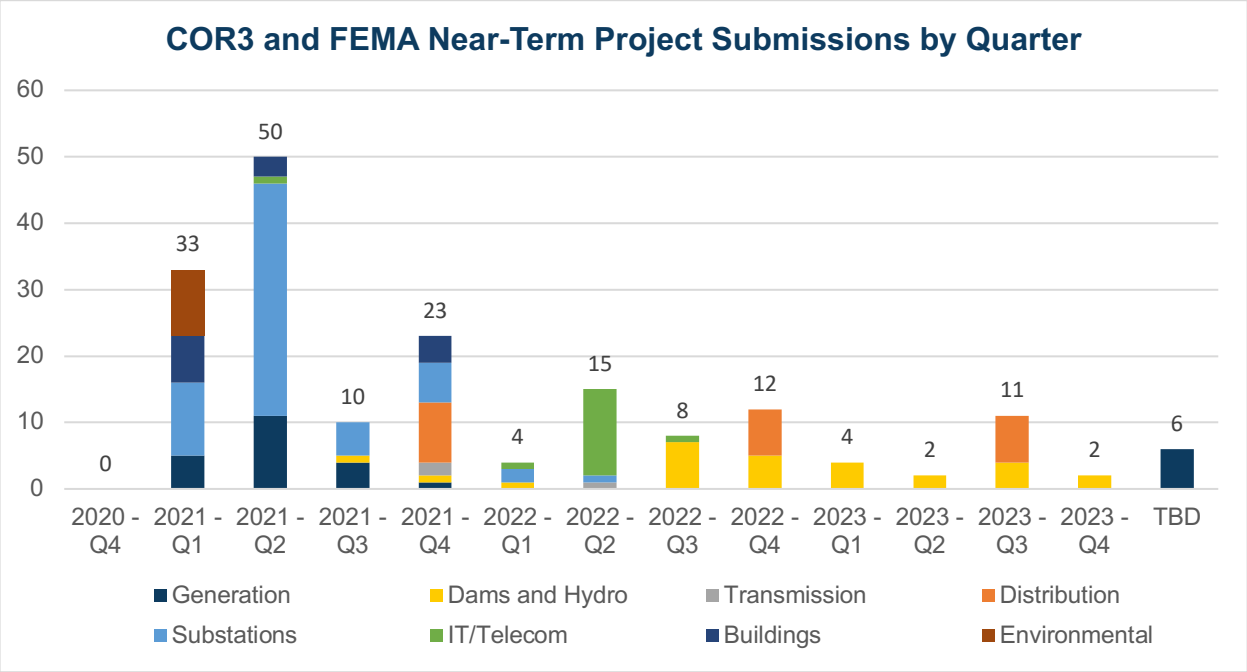
Table 4.2 – Summary of Near-Term Priority Projects

Asset Category	# of Projects Initiated			Total Projects	Total Cost Estimates (millions)
	2021	2022	2023		
Generation	27	0	0	27	$1,305.57
Dams and Hydro	12	11	12	35	$703.26
Transmission	3	0	0	3	$896.95
Distribution	16	7	7	30	$3,454.89
Substations	51	9	0	60	$568.49
IT/Telecom	16	0	0	16	$675.10
Buildings	14	0	0	14	$9.87
Environmental	10	0	0	10	$15.19
Total	**149**	**27**	**19**	**195**	**$7,629.32**

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, 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 PREPA's 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
New Combined-Cycle near San Juan	The combined cycle plant to be located in the San Juan area addresses a power generation crisis created by the weakening of Puerto Rico's electric grid caused by hurricane María. This project includes the installation of a 400 MW state-of-the-art combined cycle power plant with dual fuel capabilities (with natural gas as the primary fuel and diesel as a secondary fuel) designed to the most current engineering codes and standards and capable of withstanding major catastrophic events, such as hurricanes, high wind events, and major seismic events.	2021 Q3	$572.40 Note: funded through FEMA 404 program	Section III E
New Emergency Generation / Peaker Units	This project includes the installation of dual fuel (natural gas and diesel) gas turbines each with an output of approximately 30 MW, for a total expected generation capacity of approximately 330 MW across five PREPA-owned locations: Daguao, Jobos, Vega Baja, Yabucoa, and a location in the San Juan area. During Phase I of this project, a more in-depth technical study will be conducted as to the optimum permanent locations for the units and to investigate the possibility to procure mobile Generation Turbines that can be deployed as necessary around the island to strategic locations where power may be needed following an emergency, such as hurricanes and earthquakes. This 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.	2021 Q3	$280.80 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	This project is designed to deliver required improvements and upgrades 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 required operational improvements, and development of a plan for all required improvements.	TBD	$157.50 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
New Black Start System at Aguirre	The Aguirre thermal units 1 and 2 each with an output of 450 MW require approximately 27 MW of black start capability. The two existing black start units, GT#21 and GT#22 failed to function after hurricane María. The objective of this project is to replace these two outdated black start units at the Aguirre power plant with new rapid start aeroderivative gas turbines that can provide reliable black start capabilities to the plant and inject power into the grid for voltage stability.	2021 Q1	$45.20	Section III C
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 new rapid start aeroderivative gas turbines 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.	2021 Q1	$45.20	Section III C
Power Plants Other Repairs/ Replacement Projects	This project is designed to deliver required improvements and upgrades 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 required operational improvements, and development of a plan for all required improvements.	TBD	$44.00 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
Power Plants Storage Tanks/Fuel Systems Projects	Power Plants Units-Related Works and Repairs Projects improvements and upgrades 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, 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 the current systems and make operation improvements as needed, and development of a preliminary design of improvements and review with PREPA for comments and approval.	TBD	$32.00 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Cambalache Unit 1 Repairs	Cambalache Unit 1 has been out of service (not operational) since September 2011 due to a controls error that permitted steam injection at an incorrect period during the start sequence which damaged the casing and combustion system. This project consists of recommissioning unit 1 to bring it back to service and provide ~80 MW of additional capacity in only 6 months.	2021 Q2	$19.00 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Aguirre Unit 1 Major Overhaul	Perform an overhaul on the steam turbine and boiler Unit #1 at the Aguirre power plant per original equipment manufacturer (OEM) standards.	2021 Q2	$18.00 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
San Juan Unit 10 Repairs	Steam turbine, generator, and boiler inspection and repairs as defined in the scope of works may include equipment disassembly, inspection, and reassembly of applicable components in accordance with OEM maintenance procedures and specifications. Based on the visual inspection of the "as-is" condition of the components, OEM will provide recommendations on parts replacement or repair as needed and will make every effort to expedite repairs and or parts necessary to meet customer outage expectations.	2021 Q1	$15.00 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Power Plants Electrical/Controls Projects	Power Plants Electrical/Controls Projects improvements and upgrades 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, 5) Costa Sur power plant. Work includes site assessment of current systems and installed equipment, verification of code compliance, review of current drawings	TBD	$14.00 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
	(mechanical, electrical, and instrument and controls), interview of operators to assess the current systems and make operation improvements as needed, and development of a preliminary design of improvements and review with PREPA for comments and approval.			
Power Plants Water Systems Projects	Fire protection improvements and upgrades are 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 make operation improvements as needed, and development of a preliminary design of improvements and review with PREPA for comments and approval.	TBD	$12.80 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Aguirre Steam Plant Repairs	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 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.	2021 Q2	$9.20	Section III C
Aguirre CC Main Power Transformer	The power plant main power transformers (MPT) at the Aguirre combined cycle plant have been operating for more than 45 years and have reached their operating useful life since their installation date (INST DATE). These MPT transformers are due to be replaced soon.	2021 Q4	$6.60 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
Cambalache Power Plant Repairs	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 Q2	$6.41	Section III C
Palo Seco Steam Plant Repairs	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 Q2	$5.00	Section III C
Jobos Gas Plant Repairs	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,	2021 Q2	$4.22	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	and cost estimates to complete the needed hurricane María related repairs.			
Power Plants Fire Systems Projects	Fire protection improvements and upgrades are 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 requirements, review of current drawings (mechanical, electrical, and instrument and controls), interview of operators to assess the current fire protection system and make operation improvements as needed, and development of a preliminary design of improvements and review with PREPA for comments and approval.	TBD	$4.20 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Cambalache Dike	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 Q1	$4.00	Section III C
San Juan Steam Plant Repairs	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 Q2	$3.83	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Mayagüez Gas Plant Repairs	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 and structures were repaired to put the generating units back in service and avoid further deterioration.	2021 Q2	$2.66	Section III C
Daguao Gas Plant Repairs	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 Q2	$1.96	Section III C
Yabucoa Gas Plant Repairs	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 Q2	$1.10	Section III C
Vega Baja Gas Plant Repairs	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	2021 Q2	$0.49	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	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.			
Renewable Generation Projects	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued in July 2020, the Puerto Rico Energy Bureau orders 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 to the PREPA system in the near- and mid-terms. Six tranches of solar PV or other renewable (450 MW, 500 MW, 500 MW, 500 MW, 500 MW, and 750 MW, respectively) have been identified for the near- and mid-terms to be distributed throughout the island. Currently these projects are still in the early stages of the public bid and a request for proposal to private entities is expected to be issued in 2021 Q1/Q2. The exact location of each project has not yet been identified since the location of each project will be determined by its developer.	2021 Q1	$0.00 Note: Cost to be estimated in a future plan update	Section III E
Battery energy storage	In the Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan issued in July 2020, the Puerto Rico Energy Bureau orders 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 battery storage to the PREPA system in the near- and mid-terms. Six tranches of battery storage (225 MW, 250 MW, 250 MW, 250 MW, 125 MW, and 125 MW, respectively) have been identified for the near- and mid-terms to be distributed throughout the island. Currently these projects are still in the early stages of the public bid and a request for proposal to private entities is expected to be issued in 2021 Q1/Q2. The exact location of each project has not yet been identified. Once battery storage projects are added to the system, these will also provide some grid support.	2021 Q3	$0.00 Note: Cost to be estimated in a future plan update	Section III E

Generation Project Name	Brief Description	Est. COR3 /FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
Demolition of Black Starts and Peaker Units	The Aguirre black start, Costa Sur black start, and 11 peaking gas turbines located at Daguao (2), Jobos (2), Palo Seco (3), Vega Baja (2), and Yabucoa (2) are scheduled to be replaced in the near-term with more efficient and technological advanced power generation equipment. Once the project is given notice to proceed and released for construction, the project will start with demolition and disposal of the existing gas turbines.	2021 Q3	$0.00 Note: Cost to be estimated in a future plan update	Section III C

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.	2023 Q3	$566.09	Section III C
Diversion Canal and Forebay	The Isabela Irrigation District is composed of the Guajataca Dam and the Derivation 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 derivation 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 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.	2022 Q3	$20.00	Section III C
Early Warning System	The purpose of this project is to install an island-wide early warning system (EWS) for thirty-seven (37) dams	2022 Q3	$20.00	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
(Dams) Project	administered by PREPA. Each installed EWS will monitor the risk of dam rupture or damage, providing a warning signal to vulnerable areas downstream of the dam and first responders.			
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.	2023 Q3	$19.84	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.	2022 Q3	$19.47	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 heavy rains, surface water runoff carrying debris, soil erosion, and landslides.	2022 Q4	$18.99	Section III C
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 Q1	$10.18	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	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.	2024	$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.	2024	$3.08	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.	2023 Q1	$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.	2023 Q4	$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.	2022 Q4	$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 Q1	$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.	2022 Q3	$1.65	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.	2024	$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.	2024	$1.25	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,	2024	$1.05	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	bridges, bridge access, gabion baskets, culvert, spillway, flume, and siphon.			
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.	2024	$0.87	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
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.	2022 Q4	$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.	2023 Q3	$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	2022 Q4	$0.38	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
	system, crane structure, sedimentation of sluiceway, lights, fencing, drainage ditches, and tile drains.			
Dos Bocas	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.	2022 Q3	$0.37	Section III C
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.	2022 Q1	$0.24	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.	2024	$0.14	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.	2023 Q2	$0.12	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
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.	2022 Q3	$0.11	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.	2023 Q4	$0.08	Section III C
Río Blanco	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 Q1	$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.	2022 Q3	$0.06	Section III C

Dams and Hydro Project Name	Brief Description	Est. COR3/ FEMA Sub-mission	Est. Cost (M USD)	IRP Reference
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.	2022 Q4	$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.	2021 Q4	$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.	2021 Q3	$0.01	Section III C
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.	2023 Q3	$0.00 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 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.	2023 Q2	$0.00 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
21-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 21 transmission lines for an estimated total of 442 miles.	2021 Q4	$419.65	Section III C
12-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 12 transmission lines for an estimated total of 237 miles.	2021 Q4	$262.30	Section III C
14-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 14 transmission lines for an estimated total of 53 miles.	2022 Q2	$215.00	Section III E

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 - Intermediate Term Group - Tier 1 -	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	2022 Q3	$357.11	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Mayagüez Region	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).			
Distribution Feeders - Short 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 55 distribution feeders for an estimated total of 209.27 miles (including both overhead and underground work).	2021 Q4	$249.75	Section III C
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, 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 166.73 miles (including both overhead and underground work).	2021 Q1	$243.36	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).	2022 Q3	$236.67	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	2023 Q2	$211.02	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 street light 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.	2021 Q2	$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).	2022 Q3	$166.02	Section III C
Distribution Feeders - Short Term	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	2021 Q4	$165.35	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Group - Tier 2 - Caguas 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 41 distribution feeders for an estimated total of 123.7 miles (including both overhead and underground work).			
Distribution Feeders - Intermediate 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 53 distribution feeders for an estimated total of 80.27 miles (including both overhead and underground work).	2023 Q2	$160.47	Section III C
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).	2023 Q2	$136.73	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).	2023 Q2	$135.20	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 - 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).	2022 Q3	$128.91	Section III C
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).	2022 Q3	$126.35	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).	2023 Q2	$125.88	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	2022 Q3	$115.36	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	103.91 miles (including both overhead and underground work).			
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 77.27 miles (including both overhead and underground work).	2022 Q3	$115.27	Section III C
Distribution Feeders - Short 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 41 distribution feeders for an estimated total of 63.87 miles (including both overhead and underground work).	2021 Q4	$97.35	Section III C
Distribution Feeders - Short 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 18 distribution feeders for an estimated total of 39.23 miles (including both overhead and underground work).	2021 Q1	$60.88	Section III C
Distribution Feeders - Intermediate 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	2023 Q2	$50.21	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 12 distribution feeders for an estimated total of 25.81 miles (including both overhead and underground work).			
Distribution Feeders - Short 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 10 distribution feeders for an estimated total of 38.32 miles (including both overhead and underground work).	2021 Q1	$49.19	Section III C
Distribution Feeders - Short 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 8 distribution feeders for an estimated total of 32.13 miles (including both overhead and underground work).	2021 Q1	$48.71	Section III C
Distribution Feeders - Short 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 16 distribution feeders for an estimated total of 30.45 miles (including both overhead and underground work).	2021 Q4	$46.44	Section III C
Distribution Feeders - Short Term Group - Tier 2	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	2021 Q4	$44.85	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
- Arecibo 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 9 distribution feeders for an estimated total of 44.93 miles (including both overhead and underground work).			
Distribution Feeders - Short 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 12 distribution feeders for an estimated total of 33.76 miles (including both overhead and underground work).	2021 Q4	$41.70	Section III C
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).	2023 Q2	$36.29	Section III C
Distribution Feeders - Short 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 13 distribution feeders for an estimated total of 25.05 miles (including both overhead and underground work).	2021 Q1	$33.83	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Distribution Feeders - Short 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 10 distribution feeders for an estimated total of 24.65 miles (including both overhead and underground work).	2021 Q1	$32.77	Section III C
Distribution Feeders - Short 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 14 distribution feeders for an estimated total of 46.3 miles (including both overhead and underground work).	2021 Q1	$32.21	Section III C
Distribution Feeders - Short 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 5 distribution feeders for an estimated total of 12.59 miles (including both overhead and underground work).	2021 Q4	$21.51	Section III C
Distribution Automation - All Regions	PREPA will implement distribution automation (DA) with line devices and apparatus on the distribution system comprising 1228 circuits feeding 1.5 million customers. PREPA will install new switches, reclosers, capacitor bank controllers, and voltage regulators, all equipped with communications. On average, one-line reclosure device will be added for approximately every 500 customers. Intelligent fuse cutouts reclosers are planned for 8 devices per 500 customers.	2021 Q1	$0.00 Note: Cost to be estimated in a future plan update	Section III E

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	Coupled with the Advanced Meter Infrastructure (AMI), Advanced Distribution Management System (ADMS), and the Field Area Network (FAN) IT / Telecom projects, this DA project will contribute to PREPA's full realization of a self-healing Smart Grid to allow PREPA to realize significant improvements in customer reliability as measured by industry standard performance metrics or indices such SAIDI, SAIFI, and CAIDI. In addition, line conditioning will be implemented with the installation of voltage regulators and cap bank controllers to maintain grid health (e.g., power factor and quality) delivered to customers which will be important as more and more distributed energy resources (e.g., solar and wind farms) are being deployed across the grid.			

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
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 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.	2021 Q1	$64.60 Note: funded through 428 and PREPA NME	Section III C
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.	2021 Q2	$52.00 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
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.	2021 Q2	$47.90	Section III E
Flooded Substations	The objective of this project is to relocate 10 substations that are prone to flooding conditions from their current locations within floodplains to greenfield sites while correcting continued challenges in service limitations continue to this day. The relocation and subsequent new facilities will harden substation components and systems, design equipment to consensus-based codes and standards, increase reliability of service to customers, reduce risk of future flooding, and improve safety to personnel and public.	2021 Q4	$42.00	Section III C
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.	2021 Q2	$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 ensure compliance with consensus-based codes and standards including IEC 61850.	2021 Q2	$34.00 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Palo Seco Generation & Transmission Modernization	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	2021 Q2	$32.00 Note: funded	N/A

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
and Hardening	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.		through PREPA NME	Necessary PREPA Maintenance
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 any safety hazards due to equipment damage and environmental concerns.	2021 Q3	$30.00	Section III C
Tapia GIS 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 any safety hazards due to equipment damage and environmental concerns.	2022 Q2	$21.40	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.	2021 Q2	$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 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.	2021 Q2	$18.00 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
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.	2021 Q2	$17.60 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
Guaynabo Pueblo Relocation	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 relocate and to conform this critical asset substation facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q4	$16.10	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2022 Q1	$10.70	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2022 Q1	$10.30	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Cataño Modernization and Hardening Project	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.	2021 Q1	$8.00	Section III C
Victoria TC 7008	The objective is to replace damaged control house and other related damaged equipment and to conform this critical asset substation facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment damage and environmental concerns.	2021 Q2	$7.90	Section III C
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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment damage and environmental concerns.	2021 Q2	$4.70	Section III C
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 metalclad 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, resiliency, and mitigate safety, hazards, and environmental concerns.	2021 Q1	$4.40	Section III C
Bayamón TC - MC - 1711	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 & industry standards, improve system	2021 Q2	$4.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.			
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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$4.00	Section III C
Cachete - MC - 1526	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$4.00	Section III C
Caridad - MC - 1714	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 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	2021 Q2	$4.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	switchgear to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.			
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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 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 metalclad 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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$4.00	Section III C
Llorens Torres - MC - 1106	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 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 & industry standards, improve	2021 Q2	$4.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.			
Taft - MC - 1105	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$4.00	Section III C
Viaducto TC - MC - 1100	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$3.98	Section III C
Río Grande Estates - CH - 2306	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 critical asset substation facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment damage and environmental concerns.	2021 Q2	$2.90	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Aguirre BKRS 230kV	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$2.30	Section III C
Costa Sur BKRS 230kV	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q3	$2.30	Section III C
Minor Repairs Projects (Group A)	The objective is to clean, repair, restore and/or replace minor items within substations to PREPA & industry standards to mitigate any safety hazards and environmental concerns.	2021 Q2	$2.30	Section III C
Sabanera TRF 3603	Sabanera 3603 Substation transformer has reached end of serviceable life and will be decommissioned. The objective is to replace and to conform this critical asset to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age and/or environmental concerns.	2021 Q1	$2.30	Section III C
Bartolo TRF 7902	Bartolo 7902 Substation transformer has reached end of serviceable life and will be decommissioned. The objective is to replace and to conform this critical asset to PREPA & industry standards, improve system	2021 Q1	$2.20	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	resiliency, and to mitigate any safety hazards due to equipment age and/or environmental concerns.			
Ceiba Baja TRF 7012	Ceiba Baja 7012 Substation transformer has reached end of serviceable life and will be decommissioned. The objective is to replace and to conform this critical asset to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age and/or environmental concerns.	2021 Q1	$2.20	Section III C
Las Lomas TRF 1525	Las Lomas Substation transformer has reached end of serviceable life and will be decommissioned. The objective is to replace and to conform this critical asset to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age and/or environmental concerns.	2021 Q1	$2.10	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 out the building. The objective is to remove debris, repair, replace damaged equipment and to conform this critical asset substation facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment failure, age, or environmental concerns.	2021 Q1	$2.00	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 & industry standards,	2021 Q2	$2.00	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	improve system resiliency, and to mitigate any safety hazards due to equipment failure, age, or environmental concerns.			
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 & industry standards and improve system resiliency, flexibility, and redundancy to this critical area.	2021 Q4	$1.70	Section III C
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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q4	$1.40	Section III C
Costa Sur BKRS 115kV	Costa Sur is a 230/115/38-kV substation and the 115-kV yard consists of an eight-bay, breaker-and-a-half arrangement. 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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q3	$1.40	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Bayamón TC BKRS 230kV	Bayamón TC is a 230/115/38-kV substation and the 230-kV yard consists of a three-position ring bus. Two (2) 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 these oil-filled breakers further poses environmental concerns and mitigation is necessary. The objective is to replace these end-of-life, oil-filled breakers with new SF6 circuit breakers to conform this facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q2	$1.30	Section III C
Culebra SUB 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 & industry standards, improve system resiliency, and to mitigate any 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 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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q3	$0.94	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Caparra 1911 & 1924	Perimeter fence, retaining wall, ground grid and other equipment on the yard are also damage. The objective is to replace damaged control house and other related damaged equipment and to conform this critical asset substation facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment damage and environmental concerns.	2021 Q2	$0.90	Section III C
Tallaboa 5402	Perimeter fence, retaining wall, ground grid and other equipment on the yard are also damage. The objective is to replace damaged control house and other related damaged equipment and to conform this critical asset substation facility to PREPA & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment damage and environmental concerns.	2021 Q2	$0.90	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 any safety hazards and environmental concerns.	2021 Q4	$0.70	Section III C
Manatí TC BKR 230kV	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 & industry standards, improve system resiliency, and to mitigate any safety hazards due to equipment age or environmental concerns.	2021 Q3	$0.67	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 any safety hazards and environmental concerns.	2021 Q1	$0.50	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 any safety hazards and environmental concerns.	2021 Q1	$0.50	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 any safety hazards and environmental concerns.	2021 Q4	$0.25	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 any safety hazards and environmental concerns.	2021 Q1	$0.15	Section III C
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.	2021 Q2	$0.00 Note: Cost to be estimated in a future plan update	Section III C
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 plan the modernization and hardening of these grid concern substations to bring to industry standards.	2021 Q2	$0.00 Note: Cost to be estimated in a future plan update	Section III C
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.	2021 Q2	$0.00 Note: Cost to be estimated in a future plan update	Section III C

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 has reached end-of-life and has limited availability of	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
	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 Monitoring 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 restoration efforts created inconsistencies in system data	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)	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 Q1	$41.16	Section III C
Ponce Control Center	The objective of this project is to install a new Ponce control dispatch center to new industry standards and	2022 Q2	$41.16	Section III E

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	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.			
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 system would also allow the interoperability with other P-	2022 Q2	$34.30	Section III E

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	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 Crossbow platform. Crossbow provides an integrated,	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
	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.	2022 Q2	$14.00 Note: funded through 428 and PREPA NME	Section III E
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 Q1	$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
Aguadilla ESC	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 Q2	$2.50	Section III C
Arecibo ESC	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 Q1	$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
Arecibo Regional 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 Q2	$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.	2021 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.	2021 Q1	$0.23	Section III C
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

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
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.	2021 Q1	$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.	2021 Q1	$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.	2021 Q1	$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.	2021 Q1	$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.	2021 Q1	$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 in a future plan update	Section III C

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
Transmission Line 51000 Access Road FFF, R, U, PPP, K, II, LL, MM, GGG, JJJ, OOO	This project will repair 11 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 Q1	$3.40	Section III C
Transmission Line 37400 Segments A, D, H & Transmission Line 37400 Dorado-Vega Baja Segments C, D	This project will repair five 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 Q1	$3.25	Section III C
Transmission Line 36100, 37500 Segment A, B	This project associated with Transmission Line 36100 and 37500 will repair two 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 Q1	$3.06	Section III C
Transmission Line 36200 Segment CC and Transmission Line 36200 El Yunque Segments NN,	This project associated with Transmission Line 36200 and Staging Area 11-Naguabo will repair five hurricane-damaged and unstable access roads and 1 staging area, 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	2021 Q1	$1.79	Section III C

Environmental Category Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
Q, R, Y. Staging Area 11-Naguabo	Clean Water Act in correspondence to the National Pollutant Discharge Elimination System (NPDES) permit program and USACE Nation Wide Permit #33 and #12.			
Transmission Line 36300 Segments HH, D, AAA, A, F, H	This project associated with Transmission Line 36300 will repair six 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 Q1	$1.55	Section III C
Transmission Line 40300 Segment C	This project associated with Transmission Line 40300 will repair one 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 Q1	$0.90	Section III C
Transmission Line 50700 Access Roads E, Z, B	This project associated with Transmission Line 50700 will repair three hurricane-damaged and unstable access roads and one staging area, 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 Q1	$0.72	Section III C
Transmission Line 38900 Martín Peña-Berwind Access Road	This project associated with Transmission Line 38900 will repair one hurricane-damaged and unstable access road, repair contours along the impacted access road, 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	2021 Q1	$0.31	Section III C

Environmental Category Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	Pollutant Discharge Elimination System (NPDES) permit program and USACE Nation Wide Permit #33 and #12.			
Transmission Line 37800 Cobra Tracks Access Road Segments N, A	This project associated with Transmission Line 37800 will repair two 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 Q1	$0.16	Section III C
Whitefish Staging Area Aguirre Power Plant	This project will ensure compliance with EPA Clean Water Act, in correspondence to the National Pollutant Discharge Elimination System (NPDES) permit program, requires all earthwork activities that generates great than 1.0 acre of disturbance to be permanently stabilized to pre-existing conditions after the completion of construction activities. Also, consulting will be necessary to SHPO to determine “No Adverse Effect”. Earthwork (grading), engineering, and vegetative restoration will be required to permanently stabilize the impacted Access Roads.	2021 Q1	$0.04	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.

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

Major generation projects in the mid-term include the construction of a new combined-cycle plant in the San Juan area, as well as the replacement the existing oil-fueled peaker generating units with new dual-fuel units distributed around the island.

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.

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.

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 are focused on addressing damage from sediment, storm debris, and erosion.

Transmission

Thirty-seven (37) 115kV & 230kV transmission lines and forty (40) 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 sixteen (16) 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 451. This is comprised of two elements. First, we include the remaining 65 feeders from the damage report, those with non-critical customers that were not addressed during the near-term phase. In addition, we included the 386 feeders that are part of the 10 Year Pole Replacement Program.

Substations

There are approximately 226 substations that 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:

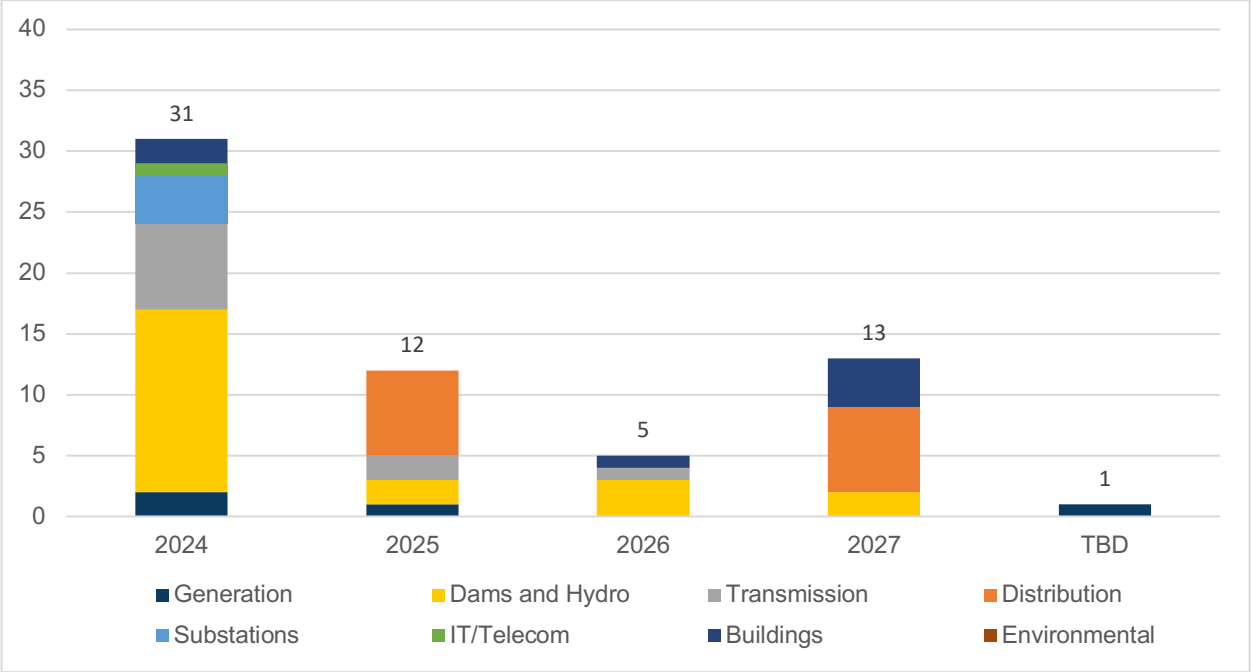
Table 4.12 – Summary of Mid-Term Priority Projects

Asset Category	# of Projects Initiated				Total Projects	Total Cost Estimates (millions)
	2024	2025	2026	2027		
Generation	4	0	0	0	4	$5.00
Dams and Hydro	7	3	4	0	14	$214.34
Transmission	1	2	0	0	3	$1,380.30
Distribution	0	7	0	7	14	$932.01
Substations	4	0	0	0	4	$426.16
IT/Telecom	1	0	0	0	1	$102.90
Buildings	2	0	1	4	7	$47.60
Environmental	0	0	0	0	0	$0.00
Total	**19**	**12**	**5**	**11**	**47**	**$3,108.31**

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
Cambalache Main Power Transformers	The power plant main power transformers (MPT) and auxiliary transformers (AUX) at Cambalache have been operating for over 23 years from installation date (INST DATE). These transformers are reaching their useful life and will be due for replacement in the mid future.	2025	$5.0 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
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	2024	$0.00 Note: Cost to be estimated in a future	Section III C

Generation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	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 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		plan update	
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.	TBD	$0.00 Note: 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 room at each of these facilities for other uses.	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

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, Pellajas, 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
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 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	$0.84	Section III C
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
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 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,	2024	$0.13	Section III C

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	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
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
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 parking area, and sedimentation of intake rack structure and surroundings.	2024	$0.06	Section III C
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
37-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	$548.60	Section III C
40-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	$537.70	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

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 - 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	$248.59	Section III C
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	$115.08	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	$75.19	Section III C
Distribution Feeders - Long Term Group - Tier 1	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	2025	$70.85	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
- Ponce Region	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).			
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 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).	2025	$57.33	Section III C
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	$57.03	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	$56.99	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
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	$51.73	Section III C
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	$45.63	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	$45.20	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	2027	$38.57	Section III C

Distribution Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	23.18 miles (including both overhead and underground work).			
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	$28.88	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	$24.18	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 9.63 miles (including both overhead and underground work).	2025	$16.76	Section III C

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
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. The scope of this project includes 9 Substations with Distribution Work and 330 Substation with Transmission Work.	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.	2024	$100.00 Note: funded through PREPA NME	N/A Necessary PREPA Maintenance
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. The scope of this project includes 32 Transmission Line Terminals, 6 Substations with Distribution Work, and 93 Substation with Transmission Work.	2024	$93.50	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
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

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	2024	$102.90	Section III C

IT / Telecom Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	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.			

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	2027	$3.52	Section III C

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	throughout the island. This includes sites and buildings associated with the Cayey, Guayama, Hormigueros, Isabela, Juana Díaz, Corozal, and San Sebastián Commercial Offices.			
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
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.

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

Section	Plan Information Provided
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 in the long term will consist of further increasing the renewable generation and battery storage on the island to meet the established RPS targets per year.

This will also include the implementation of any grid support projects that may be required to allow the system to operate reliably and safely. With the placement of new generation in the near and mid-terms, some adjustments will be made to these units over time.

As the retirement of oil and coal fired facilities occurs, a focus must remain on keeping the cost of electricity in check. In the long-term, renewable generation is expected to be well-established and in this period of time, the simple cycle peaking units tied to natural gas import locations may be converted to combined cycle configurations to provide additional gains in thermal efficiency, thus keeping electrical production costs low while at the same time keeping the grid stable with the required inertial support for reliability and power quality.

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

Transmission

Twenty-eight (28) 115kV & 230kV transmission lines and eighty-six (86) 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.

Distribution

Long-term projects include all remaining feeders not included in the near-term or mid-term, approximately 668 feeders (subject to verification). Within this phase, feeders were sorted based on whether there were critical customers and then by the SAIFI/SAIDI indices.

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:

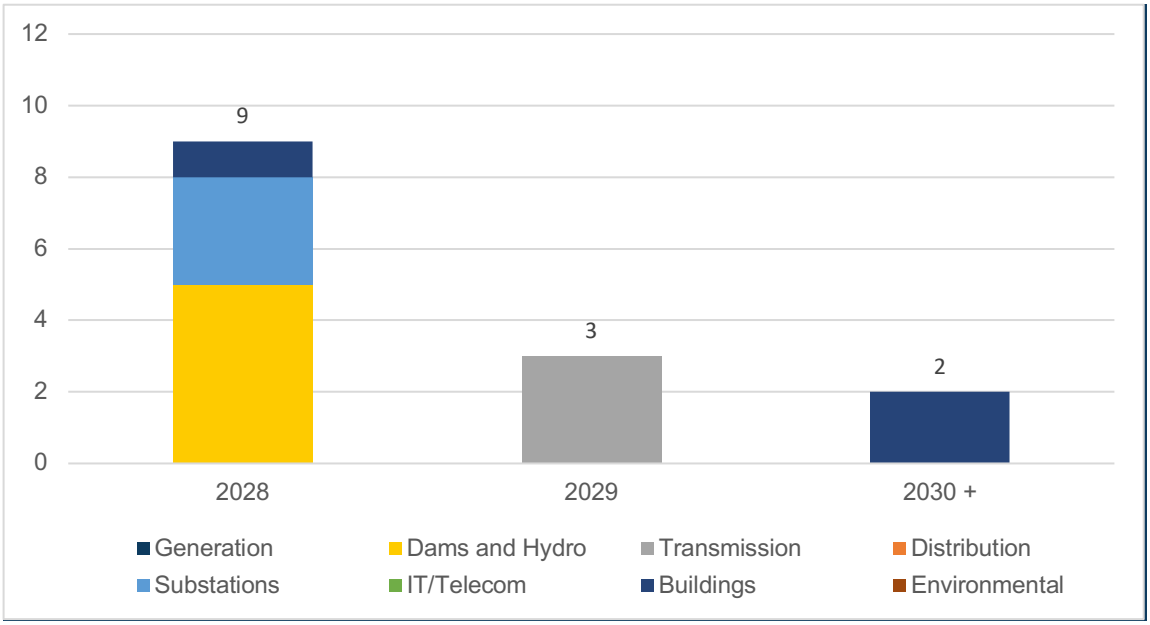
Table 4.21 – Summary of Long-Term Priority Projects

Asset Category	# of Projects Initiated			Total Projects	Total Cost Estimates (millions)
	2028	2029	2030		
Generation	0	0	0	0	$0.00
Dams and Hydro	5	0	0	5	$3.25
Transmission	1	2	0	3	$887.35
Distribution	0	0	0	0	$0.00
Substations	3	0	0	3	$155.88
IT/Telecom	0	0	0	0	$0.00
Buildings	1	0	2	3	$5.11
Other	0	0	0	0	$0.00
Total	**10**	**2**	**2**	**14**	**$1,051.59**

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 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.	2028	$2.73	Section III C
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

Dams & Hydro Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
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	$422.65	Section III C
86-Transmission	The objective of this project is to harden existing 38kV transmission lines to consensus-based codes and	2029	$363.70	Section III C

Transmission Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (USD)	IRP Reference
Existing (38 kV)	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.			
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

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. The scope of this project includes 3 Substations with Distribution Work and 106 Substation with Transmission Work.	2028	$97.74	Section III C

Substation Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
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. The scope of this project includes 12 Transmission Line Terminals, 1 Substations with Distribution Work, and 40 Substation with Transmission Work.	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. The scope of this project includes 1 Substations with Distribution Work and 11 Substation with Transmission Work.	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	2030 +	$2.40	Section III C

Buildings Project Name	Brief Description	Est. COR3 /FEMA Submission	Est. Cost (M USD)	IRP Reference
	working order to provide adequate and reliable service in the region.			
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

V. 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 noted in the appendix of this document.

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 Q1

Table 5.1 – 2021 Q1 Milestones

#	Project Name	Asset Category
2021 Q1 – Milestone: Begin 30% Architecture **and Engineering Design**		
1	New combined-cycle near San Juan	Generation
2	Power Plants Units-related Works and Repairs Projects	
3	New Black Start System at Aguirre	
4	New Black Start System at Costa Sur	

#	Project Name	Asset Category
5	Power Plants Other Repairs/Replacement Projects	
6	Power Plants Storage Tanks/Fuel Systems Projects	
7	Cambalache Unit 1 Repairs	
8	Aguirre Unit 1 Major Overhaul	
9	San Juan Unit 10 Repairs	
10	Power Plants Electrical/Controls Projects	
11	Power Plants Water Systems Projects	
12	Power Plants Fire Systems Projects	
13	Renewable Generation Projects	
14	Battery energy storage	
15	Icacos Dam	Dams and Hydro
16	14-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
17	21-Transmission Existing (38 kV)	
18	12-Transmission Existing (115 & 230 kV)	
19	Distribution Automation - All Regions	Distribution
20	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	
21	Distribution Feeders - Short Term Group - Tier 1 - Bayamón Region	
22	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	
23	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	
24	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	
25	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	
26	Distribution Feeders - Short Term Group - Tier 1 - Mayagüez Region	
27	San Juan 115kV GIS	Substations
28	Costa Sur Generation & Transmission Modernization and Hardening	
29	Flooded Substations	
30	Aguirre Generation & Switchyard Modernization & Hardening	

#	Project Name	Asset Category
31	Mayagüez Generation & Transmission Modernization and Hardening	
32	Palo Seco Generation & Transmission Modernization and Hardening	
33	Río Blanco TC Grid Constraint Mitigation	
34	Río Blanco Generation & Transmission Modernization and Hardening	
35	Cambalache Generation & Transmission Modernization and Hardening	
36	Cataño Modernization and Hardening Project	
37	Victoria TC 7008	
38	Naguabo 2701	
39	Caparra 1911 & 1924	
40	Tallaboa 5402	
41	Advanced Metering Infrastructure (AMI)	IT/Telecom
42	Cybersecurity Program Implementation	
43	FAN	
44	MPLS Network Deployment	
45	Physical Security Assessment for Facilities	
46	Monacillo Control Center	
47	Ponce Control Center	
48	Energy Management System (EMS) (OT/Backoffice)	
49	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	
50	LMR Two-way radio P-25	
51	Infrastructure	
52	SCADA RTU Replacement	
53	Microwave PTP	
54	GIS System	
55	IT Corporate Network	
56	Meter & Automation Lab	
57	Arecibo ESC	Buildings

#	Project Name	Asset Category
58	Aguadilla ESC	
59	Bayamón Region Miscellaneous Repairs	
60	Mayagüez Region Miscellaneous Repairs	
61	Arecibo Region Miscellaneous Repairs	
62	Caguas Region Miscellaneous Repairs	
63	Ponce Region Miscellaneous Repairs	
64	Carolina Region Miscellaneous Repairs	
65	Transmission Line 51000 Access Road FFF, R, U, PPP, K, II, LL, MM, GGG, JJJ, OOO	Other
66	Transmission Line 37400 Segments A, D, H & Transmission Line 37400 Dorado-Vega Baja Segments C, D	
67	Transmission Line 36100, 37500 Segment A, B	
68	Transmission Line 36200 Segment CC and Transmission Line 36200 El Yunque Segments NN, Q, R, Y. Staging Area 11-Naguabo	
69	Transmission Line 36300 Segments HH, D, AAA, A, F, H	
70	Transmission Line 40300 Segment C	
71	Transmission Line 50700 Access Roads E, Z, B	
72	Transmission Line 38900 Martín Peña-Berwind Access Road	
73	Transmission Line 37800 Cobra Tracks Access Road Segments N, A	
74	Whitefish Staging Area Aguirre Power Plant	
2021 Q1 – Milestone: Submit Project to COR3 and FEMA for Review		
1	New Black Start System at Aguirre	Generation
2	New Black Start System at Costa Sur	
3	San Juan Unit 10 Repairs	
4	Cambalache Dike	
5	Renewable Generation Projects	
6	San Juan 115kV GIS	Substations
7	Cataño Modernization and Hardening Project	

#	Project Name	Asset Category
8	Isla Grande 1101	
9	Sabanera TRF 3603	
10	Bartolo TRF 7902	
11	Ceiba Baja TRF 7012	
12	Las Lomas TRF 1525	
13	Isla Grande GIS	
14	Jayuya Minor Rprs - 8301	
15	Salinas Urbano Minor Rprs - 4501	
16	Sabana Grande Minor Rprs - 6501	
17	Arecibo ESC	Buildings
18	Bayamón Region Miscellaneous Repairs	
19	Mayagüez Region Miscellaneous Repairs	
20	Arecibo Region Miscellaneous Repairs	
21	Caguas Region Miscellaneous Repairs	
22	Ponce Region Miscellaneous Repairs	
23	Carolina Region Miscellaneous Repairs	
24	Transmission Line 51000 Access Road FFF, R, U, PPP, K, II, LL, MM, GGG, JJJ, OOO	Other
25	Transmission Line 37400 Segments A, D, H & Transmission Line 37400 Dorado-Vega Baja Segments C, D	
26	Transmission Line 36100, 37500 Segment A, B	
27	Transmission Line 36200 Segment CC and Transmission Line 36200 El Yunque Segments NN, Q, R, Y. Staging Area 11-Naguabo	
28	Transmission Line 36300 Segments HH, D, AAA, A, F, H	
29	Transmission Line 40300 Segment C	
30	Transmission Line 50700 Access Roads E, Z, B	
31	Transmission Line 38900 Martín Peña-Berwind Access Road	
32	Transmission Line 37800 Cobra Tracks Access Road Segments N, A	

#	Project Name	Asset Category
33	Whitefish Staging Area Aguirre Power Plant	
2021 Q1 – Milestone: Begin Construction/Implementation		
1	Power Plants Units-related Works and Repairs Projects	Generation
2	Power Plants Other Repairs/Replacement Projects	
3	Power Plants Storage Tanks/Fuel Systems Projects	
4	Power Plants Electrical/Controls Projects	
5	Power Plants Water Systems Projects	
6	Power Plants Fire Systems Projects	
2021 Q1 – Milestone: Begin COR3 and FEMA Project Closeout		
	None	

2021 Q2

Table 5.2 – 2021 Q2 Milestones

#	Project Name	Asset Category
2021 Q2 – Milestone: Begin 30% Architecture and Engineering Design		
1	New Peaker Units	Generation
2	Aguirre Steam Plant Repairs	
3	Cambalache Dike	
4	Cambalache Power Plant Repairs	
5	Palo Seco Steam Plant Repairs	
6	Jobos Gas Plant Repairs	
7	San Juan Steam Plant Repairs	
8	Mayagüez Gas Plant Repairs	
9	Daguao Gas Plant Repairs	
10	Yabucoa Gas Plant Repairs	
11	Vega Baja Gas Plant Repairs	

#	Project Name	Asset Category
12	Demolition of Black Starts and Peaker Units	
13	Guajataca Dam - Study/Assessment - Detailed Design - Procurement	Dams and Hydro
14	Garzas Dam	
15	Streetlights - All Regions	Distribution
16	Isla Grande 1101	Substations
17	Bayamón TC - MC - 1711	
18	Berwind TC- MC - 1336	
19	Cachete - MC - 1526	
20	Caridad - MC - 1714	
21	Condado - MC - 1133	
22	Crematorio - MC - 1512	
23	Egozcue - MC - 1109	
24	Esc. Industrial M. Such - MC - 1423	
25	Llorens Torres - MC - 1106	
26	Parques y Recreos - MC - 1002	
27	Puerto Nuevo - MC - 1520	
28	Taft - MC - 1105	
29	Viaducto TC - MC - 1100	
30	Baldrich - MC - 1422	
31	Río Grande Estates - CH - 2306	
32	Aguirre BKRS 230kV	
33	Sabanera TRF 3603	
34	Bartolo TRF 7902	
35	Ceiba Baja TRF 7012	
36	Las Lomas TRF 1525	
37	Isla Grande GIS	
38	Vieques SUB 2501	

#	Project Name	Asset Category
39	Bayamón TC BKRS 230kV	
40	Culebra SUB 3801	
41	Jayuya Minor Rprs - 8301	
42	Salinas Urbano Minor Rprs - 4501	
43	Sabana Grande Minor Rprs - 6501	
44	Arecibo Regional Building	Buildings
45	San Germán ESC	
2021 Q2 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Cambalache Unit 1 Repairs	Generation
2	Aguirre Unit 1 Major Overhaul	
3	Aguirre Steam Plant Repairs	
4	Cambalache Power Plant Repairs	
5	Palo Seco Steam Plant Repairs	
6	Jobos Gas Plant Repairs	
7	San Juan Steam Plant Repairs	
8	Mayagüez Gas Plant Repairs	
9	Daguao Gas Plant Repairs	
10	Yabucoa Gas Plant Repairs	
11	Vega Baja Gas Plant Repairs	
12	Costa Sur Generation & Transmission Modernization and Hardening	Substations
13	T-Line Substation Terminals	
14	Aguirre Generation & Switchyard Modernization & Hardening	
15	Mayagüez Generation & Transmission Modernization and Hardening	
16	Palo Seco Generation & Transmission Modernization and Hardening	
17	Río Blanco TC Grid Constraint Mitigation	
18	Río Blanco Generation & Transmission Modernization and Hardening	
19	Cambalache Generation & Transmission Modernization and Hardening	

#	Project Name	Asset Category
20	Victoria TC 7008	
21	Naguabo 2701	
22	Bayamón TC - MC - 1711	
23	Berwind TC- MC - 1336	
24	Cachete - MC - 1526	
25	Caridad - MC - 1714	
26	Condado - MC - 1133	
27	Crematorio - MC - 1512	
28	Egozcue - MC - 1109	
29	Esc. Industrial M. Such - MC - 1423	
30	Llorens Torres - MC - 1106	
31	Parques y Recreos - MC - 1002	
32	Puerto Nuevo - MC - 1520	
33	Taft - MC - 1105	
34	Viaducto TC - MC - 1100	
35	Baldrich - MC - 1422	
36	Río Grande Estates - CH - 2306	
37	Aguirre BKRS 230kV	
38	Minor Repairs Projects (Group A)	
39	Vieques SUB 2501	
40	Bayamón TC BKRS 230kV	
41	Culebra SUB 3801	
42	Caparra 1911 & 1924	
43	Tallaboa 5402	
44	Gen. & Switchyard Modernization Substations - Project Description	
45	Grid Concern Substations - Project Description	
46	Modernization & Hardening Substations - Project Description	

#	Project Name	Asset Category
47	GIS System	IT/Telecom
48	Aguadilla ESC	Buildings
49	Arecibo Regional Building	
50	San Germán ESC	
2021 Q2 – Milestone: Begin Construction/Implementation		
1	Bayamón Region Miscellaneous Repairs	Buildings
2	Mayagüez Region Miscellaneous Repairs	
3	Arecibo Region Miscellaneous Repairs	
4	Caguas Region Miscellaneous Repairs	
5	Ponce Region Miscellaneous Repairs	
6	Carolina Region Miscellaneous Repairs	
2021 Q2 – Milestone: Begin COR3 and FEMA Project Closeout		
	None	

2021 Q3

Table 5.3 – 2021 Q3 Milestones

#	Project Name	Asset Category
2021 Q3 – Milestone: Begin 30% Architecture and Engineering Design		
1	Diversion Canal and Forebay	Hydro and Dams
2	Río Blanco Penstock	
3	Río Blanco Hydroelectric System Connection	
4	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
5	Toro Negro 2 Penstock	
6	Toro Negro Hydroelectric System Connection (4)	
7	Guineo Dam	
8	T-Line Substation Terminals	Substations

#	Project Name	Asset Category
9	Fonalledas GIS Rebuilt 1401 1421	
10	Minor Repairs Projects (Group A)	
11	Costa Sur BKRS 230kV	
12	Costa Sur BKRS 115kV	
13	Caguas TC BKRS 115kV	
14	Manatí TC BKRS 230kV	
2021 Q3 – Milestone: Submit Project to COR3 and FEMA for Review		
1	New combined-cycle near San Juan	Generation
2	New Peaker Units	
3	Battery energy storage	
4	Demolition of Black Starts and Peaker Units	
5	Icacos Dam	Hydro and Dams
6	Fonalledas GIS Rebuilt 1401 1421	Substations
7	Costa Sur BKRS 230kV	
8	Costa Sur BKRS 115kV	
9	Caguas TC BKRS 115kV	
10	Manatí TC BKRS 230kV	
2021 Q3 – Milestone: Begin Construction/Implementation		
1	New Black Start System at Aguirre	Generation
2	New Black Start System at Costa Sur	
3	San Juan Unit 10 Repairs	
4	Renewable Generation Projects	
5	Battery energy storage	
6	San Juan 115kV GIS	Substations
7	Salinas Urbano Minor Rprs - 4501	
8	Jayuya Minor Rprs - 8301	

#	Project Name	Asset Category
9	Sabana Grande Minor Rprs - 6501	
10	GIS System	IT/Telecom
2021 Q3 – Milestone: Begin COR3 and FEMA Project Closeout		
	None	

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	Generation
2	Guajataca Reservoir	Dams and Hydro
3	Guerrero Reservoir	
4	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Distribution
5	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	
6	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	
7	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	
8	Distribution Feeders - Short Term Group - Tier 2 - Mayagüez Region	
9	Distribution Feeders - Short Term Group - Tier 2 - Bayamón Region	
10	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	
11	Guaynabo Pueblo Relocation	Substations
12	Canas TC BKRS 115kV	
13	Ponce Warehouse at Ponce ESC	Buildings
14	Ponce Calle Villa	
15	Palo Seco North & South	
16	Toa Baja Technical Services	
2021 Q4 – Milestone: Submit Project to COR3 and FEMA for Review		

#	Project Name	Asset Category
1	Aguirre CC Main Power Transformer	Generation
2	Guineo Dam	Hydro and Dams
3	21-Transmission Existing (38 kV)	Transmission
4	12-Transmission Existing (115 & 230 kV)	
5	Streetlights - All Regions	Distribution
6	Distribution Automation - All Regions	
7	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	
8	Distribution Feeders - Short Term Group - Tier 1 - Bayamón Region	
9	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	
10	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	
11	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	
12	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	
13	Distribution Feeders - Short Term Group - Tier 1 - Mayagüez Region	
14	Flooded Substations	Substations
15	Guaynabo Pueblo Relocation	
16	Hato Rey TC GIS UG Terminal	
17	Canas TC BKRS 115kV	
18	Covadonga GIS Minor Rprs - 1011	
19	Coamo PDS Minor Rprs - 4603	
20	Ponce Warehouse at Ponce ESC	Buildings
21	Ponce Calle Villa	
22	Palo Seco North & South	
23	Toa Baja Technical Services	
2021 Q4 – Milestone: Begin Construction/Implementation		
1	Cambalache Unit 1 Repairs	Generation
2	Aguirre Steam Plant Repairs	

#	Project Name	Asset Category
3	Cambalache Dike	
4	Cambalache Power Plant Repairs	
5	Palo Seco Steam Plant Repairs	
6	Jobos Gas Plant Repairs	
7	San Juan Steam Plant Repairs	
8	Mayagüez Gas Plant Repairs	
9	Daguao Gas Plant Repairs	
10	Yabucoa Gas Plant Repairs	
11	Vega Baja Gas Plant Repairs	
12	Icacos Dam	Hydro and Dams
13	Isla Grande 1101	Substations
14	Minor Repairs Projects (Group A)	
15	Isla Grande GIS	
16	Aguadilla ESC	Buildings
17	Arecibo Regional Building	
18	San Germán ESC	
19	Transmission Line 51000 Access Road FFF, R, U, PPP, K, II, LL, MM, GGG, JJJ, OOO	Environmental
20	Transmission Line 37400 Segments A, D, H & Transmission Line 37400 Dorado-Vega Baja Segments C, D	
21	Transmission Line 36100, 37500 Segment A, B	
22	Transmission Line 36200 Segment CC and Transmission Line 36200 El Yunque Segments NN, Q, R, Y. Staging Area 11-Naguabo	
23	Transmission Line 36300 Segments HH, D, AAA, A, F, H	
24	Transmission Line 40300 Segment C	
25	Transmission Line 50700 Access Roads E, Z, B	
26	Transmission Line 38900 Martín Peña-Berwind Access Road	
27	Transmission Line 37800 Cobra Tracks Access Road Segments N, A	

#	Project Name	Asset Category
28	Whitefish Staging Area Aguirre Power Plant	
2021 Q4 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Salinas Urbano Minor Rprs - 4501	Substations
2	Jayuya Minor Rprs - 8301	
3	Sabana Grande Minor Rprs - 6501	
4	Arecibo Regional Building	Buildings

2. 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	Centro Médico 1 & 2 1327 & 1359	Substations
2	Santurce Planta (Sect) 1116	
3	Hato Rey TC GIS UG Terminal	
4	Covadonga GIS Minor Rprs - 1011	
5	Coamo PDS Minor Rprs - 4603	
6	Gen. & Switchyard Modernization Substations - Project Description	
7	Grid Concern Substations - Project Description	
8	Modernization & Hardening Substations - Project Description	
2022 Q1 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Garzas Dam	Dams and Hydro
2	Centro Médico 1 & 2 1327 & 1359	Substations
3	Santurce Planta (Sect) 1116	
4	Infrastructure	IT/Telecom
2022 Q1 – Milestone: Begin Construction/Implementation		

#	Project Name	Asset Category
1	Aguirre Unit 1 Major Overhaul	Generation
2	Costa Sur Generation & Transmission Modernization and Hardening	Substations
3	Aguirre Generation & Switchyard Modernization & Hardening	
4	Mayagüez Generation & Transmission Modernization and Hardening	
5	Palo Seco Generation & Transmission Modernization and Hardening	
6	Río Blanco TC Grid Constraint Mitigation	
7	Río Blanco Generation & Transmission Modernization and Hardening	
8	Cambalache Generation & Transmission Modernization and Hardening	
9	Cataño Modernization and Hardening Project	
10	Victoria TC 7008	
11	Naguabo 2701	
12	Bayamón TC - MC - 1711	
13	Berwind TC- MC - 1336	
14	Cachete - MC - 1526	
15	Caridad - MC - 1714	
16	Condado - MC - 1133	
17	Crematorio - MC - 1512	
18	Egozcue - MC - 1109	
19	Esc. Industrial M. Such - MC - 1423	
20	Llorens Torres - MC - 1106	
21	Parques y Recreos - MC - 1002	
22	Puerto Nuevo - MC - 1520	
23	Taft - MC - 1105	
24	Viaducto TC - MC - 1100	
25	Baldrich - MC - 1422	
26	Río Grande Estates - CH - 2306	
27	Vieques SUB 2501	

#	Project Name	Asset Category
28	Caparra 1911 & 1924	
29	Tallaboa 5402	
30	Arecibo ESC	Buildings
2022 Q1 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Bayamón Region Miscellaneous Repairs	Buildings
2	Mayagüez Region Miscellaneous Repairs	
3	Arecibo Region Miscellaneous Repairs	
4	Caguas Region Miscellaneous Repairs	
5	Ponce Region Miscellaneous Repairs	
6	Carolina Region Miscellaneous Repairs	

2022 Q2

Table 5.6 – 2022 Q2 Milestones

#	Project Name	Asset Category
2022 Q2 – Milestone: Begin 30% Architecture and Engineering Design		
1	Juana Díaz Canal	Hydro and Dams
2	Tapia GIS Rebuilt	Substations
2022 Q2 – Milestone: Submit Project to COR3 and FEMA for Review		
1	14-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
2	Tapia GIS Rebuilt	Substations
3	Advanced Metering Infrastructure (AMI)	IT/Telecom
4	Cybersecurity Program Implementation	
5	FAN	
6	MPLS Network Deployment	
7	Physical Security Assessment for Facilities	
8	Monacillo Control Center	

#	Project Name	Asset Category
9	Ponce Control Center	
10	Energy Management System (EMS) (OT/Backoffice)	
11	LMR Two-way radio P-25	
12	SCADA RTU Replacement	
13	Microwave PTP	
14	IT Corporate Network	
15	Meter & Automation Lab	
2022 Q2 – Milestone: Begin Construction/Implementation		
1	21-Transmission Existing (38 kV)	Transmission
2	12-Transmission Existing (115 & 230 kV)	
3	Streetlights - All Regions	Distribution
4	Distribution Automation - All Regions	
5	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	
6	Distribution Feeders - Short Term Group - Tier 1 - Bayamón Region	
7	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	
8	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	
9	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	
10	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	
11	Distribution Feeders - Short Term Group - Tier 1 - Mayagüez Region	
12	Aguirre BKRS 230kV	Substations
13	Bayamón TC BKRS 230kV	
14	Culebra SUB 3801	
15	Ponce Warehouse at Ponce ESC	Buildings
16	Ponce Calle Villa	
17	Palo Seco North & South	
18	Toa Baja Technical Services	
2022 Q2 – Milestone: Begin COR3 and FEMA Project Closeout		

#	Project Name	Asset Category
1	San Juan Unit 10 Repairs	Generation
2	Icacos Dam	Dams and Hydro
3	Victoria TC 7008	Substations
4	Naguabo 2701	
5	Río Grande Estates - CH - 2306	
6	Vieques SUB 2501	
7	Caparra 1911 & 1924	
8	Tallaboa 5402	

2022 Q3

Table 5.7 – 2022 Q3 Milestones

#	Project Name	Asset Category
2022 Q3 – Milestone: Begin 30% Architecture and Engineering Design		
1	Early Warning System (Dams) Project	Dams and Hydro
2	Caonillas 1	
3	Yauco 1	
4	Dos Bocas	
5	Dos Bocas Dam	
6	Patillas Dam	
7	Matrullas Building	
8	Matrullas Dam	
9	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayagüez Region	Distribution
10	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	
11	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	
12	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamón Region	

#	Project Name	Asset Category
13	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	
14	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	
15	Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	
2022 Q3 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Early Warning System (Dams) Project	Dams and Hydro
2	Diversion Canal and Forebay	
3	Caonillas 1	
4	Guerrero Reservoir	
5	Yauco 1	
6	Dos Bocas	
7	Toro Negro Hydroelectric System Connection (4)	
8	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	IT/Telecom
2022 Q3 – Milestone: Begin Construction/Implementation		
1	New Peaker Units	Generation
2	Demolition of Black Starts and Peaker Units	
3	Fonalledas GIS Rebuilt 1401 1421	Substations
4	Guaynabo Pueblo Relocation	
5	Sabanera TRF 3603	
6	Bartolo TRF 7902	
7	Ceiba Baja TRF 7012	
8	Las Lomas TRF 1525	
9	Covadonga GIS Minor Rprs - 1011	
10	Coamo PDS Minor Rprs - 4603	
11	Infrastructure	IT/Telecom
2022 Q3 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Cambalache Unit 1 Repairs	Generation

#	Project Name	Asset Category
2	Aguirre Unit 1 Major Overhaul	
3	Power Plants Electrical/Controls Projects	
4	Cambalache Dike	
5	Culebra SUB 3801	Substations

2022 Q4

Table 5.8 – 2022 Q4 Milestones

#	Project Name	Asset Category
2022 Q4 – Milestone: Begin 30% Architecture and Engineering Design		
1	Toro Negro 1	Hydro and Dams
2	Río Blanco	
2022 Q4 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Guajataca Reservoir	Hydro and Dams
2	Juana Díaz Canal	
3	Dos Bocas Dam	
4	Patillas Dam	
5	Matrullas Dam	
6	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Distribution
7	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	
8	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	
9	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	
10	Distribution Feeders - Short Term Group - Tier 2 - Mayagüez Region	
11	Distribution Feeders - Short Term Group - Tier 2 - Bayamón Region	
12	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	
2022 Q4 – Milestone: Begin Construction/Implementation		
1	Aguirre CC Main Power Transformer	Generation

#	Project Name	Asset Category
2	T-Line Substation Terminals	Substations
3	Flooded Substations	
4	Hato Rey TC GIS UG Terminal	
5	Manatí TC BKRS 230kV	
2022 Q4 – Milestone: Begin COR3 and FEMA Project Closeout		
1	New Black Start System at Aguirre	Generation
2	New Black Start System at Costa Sur	
3	Aguirre Steam Plant Repairs	
4	Cambalache Power Plant Repairs	
5	Palo Seco Steam Plant Repairs	
6	Jobos Gas Plant Repairs	
7	San Juan Steam Plant Repairs	
8	Mayagüez Gas Plant Repairs	
9	Daguao Gas Plant Repairs	
10	Yabucoa Gas Plant Repairs	
11	Vega Baja Gas Plant Repairs	
12	Aguirre BKRS 230kV	Substations
13	Covadonga GIS Minor Rprs - 1011	
14	Bayamón TC BKRS 230kV	
15	Coamo PDS Minor Rprs - 4603	
16	Aguadilla ESC	Buildings

3. 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	Garzas 2	Hydro and Dams
2023 Q1 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Toro Negro 1	Hydro and Dams
2	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
3	Toro Negro 2 Penstock	
4	Río Blanco	
2023 Q1 – Milestone: Begin Construction/Implementation		
1	New combined-cycle near San Juan	Generation
2	Guineo Dam	Hydro and Dams
3	14-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
4	Costa Sur BKRS 230kV	Substations
5	Canas TC BKRS 115kV	
6	Costa Sur BKRS 115kV	
7	Gen. & Switchyard Modernization Substations - Project Description	
8	Grid Concern Substations - Project Description	
9	Modernization & Hardening Substations - Project Description	
10	Caguas TC BKRS 115kV	
11	Advanced Metering Infrastructure (AMI)	IT/Telecom
2023 Q1 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Power Plants Units-related Works and Repairs Projects	Generation
2	Power Plants Other Repairs/Replacement Projects	

#	Project Name	Asset Category
3	Power Plants Storage Tanks/Fuel Systems Projects	
4	Fonalledas GIS Rebuilt 1401 1421	Substations
5	Guaynabo Pueblo Relocation	
6	Isla Grande 1101	
7	Bartolo TRF 7902	
8	Isla Grande GIS	
9	Hato Rey TC GIS UG Terminal	
10	Manatí TC BKR 230kV	

2023 Q2

Table 5.10 – 2023 Q2 Milestones

#	Project Name	Asset Category
2023 Q2 – Milestone: Begin 30% Architecture and Engineering Design		
1	Main and Aguadilla Canal	Hydro and Dams
2	Moca Canal	
3	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamón Region	Distribution
4	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	
5	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	
6	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	
7	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayagüez Region	
8	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	
9	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	
2023 Q2 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Garzas 2	Hydro and Dams
2	Matrullas Building	

#	Project Name	Asset Category
2023 Q2 – Milestone: Begin Construction/Implementation		
1	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Distribution
2	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	
3	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	
4	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	
5	Distribution Feeders - Short Term Group - Tier 2 - Mayagüez Region	
6	Distribution Feeders - Short Term Group - Tier 2 - Bayamón Region	
7	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	
8	Centro Médico 1 & 2 1327 & 1359	Substations
9	Santurce Planta (Sect) 1116	
2023 Q2 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Aguirre CC Main Power Transformer	Generation
2	Cataño Pilot Project	
3	Sabanera TRF 3603	
4	Ceiba Baja TRF 7012	
5	Las Lomas TRF 1525	

2023 Q3

Table 5.11 – 2023 Q3 Milestones

#	Project Name	Asset Category
2023 Q3 – Milestone: Begin 30% Architecture and Engineering Design		
1	Guayabal Reservoir	Hydro and Dams
2	Guayabal Dam	
3	Matrullas Reservoir	
4	Garzas Reservoir	
5	Guineo Reservoir	

#	Project Name	Asset Category
6	Coamo Dam	
2023 Q3 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Guajataca Dam - Study/Assessment - Detailed Design - Procurement	Hydro and Dams
2	Río Blanco Penstock	
3	Río Blanco Hydroelectric System Connection	
4	Moca Canal	
5	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayagüez Region	Distribution
6	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	
7	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	
8	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamón Region	
9	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	
10	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	
11	Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	
2023 Q3 – Milestone: Begin Construction/Implementation		
1	Tapia GIS Rebuilt	Substations
2	Cybersecurity Program Implementation	IT/Telecom
3	FAN	
4	MPLS Network Deployment	
5	Physical Security Assessment for Facilities	
6	Monacillo Control Center	
7	Ponce Control Center	
8	Energy Management System (EMS) (OT/Backoffice)	
9	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	
10	LMR Two-way radio P-25	
11	SCADA RTU Replacement	
12	Microwave PTP	

#	Project Name	Asset Category
13	IT Corporate Network	
14	Meter & Automation Lab	
2023 Q3 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Río Blanco Generation Separation	Substations
2	Cambalache Generation Separation	
3	Costa Sur BKRS 230kV	
4	Canas TC BKRS 115kV	
5	Costa Sur BKRS 115kV	
6	Caguas TC BKRS 115kV	
7	Arecibo ESC	Buildings
8	San Germán ESC	

2023 Q4

Table 5.12 – 2023 Q4 Milestones

#	Project Name	Asset Category
2023 Q4 – Milestone: Begin 30% Architecture and Engineering Design		
1	Guamaní Canal	Hydro and Dams
2	Patillas Canal	
3	Carite Dam	
2023 Q4 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Main and Aguadilla Canal	Hydro and Dams
2	Coamo Dam	
2023 Q4 – Milestone: Begin Construction/Implementation		
1	Garzas Dam	Hydro and Dams
2023 Q4 – Milestone: Begin COR3 and FEMA Project Closeout		
1	T-Line Substation Terminals	Substations

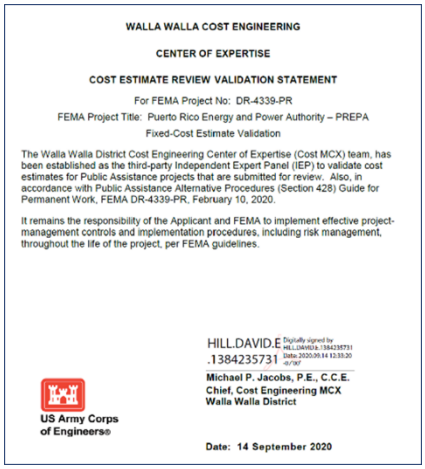
#	Project Name	Asset Category
2	Centro Médico 1 & 2 1327 & 1359	
3	Santurce Planta (Sect) 1116	
4	Bayamón TC - MC - 1711	
5	Berwind TC- MC - 1336	
6	Cachete - MC - 1526	
7	Caridad - MC - 1714	
8	Condado - MC - 1133	
9	Crematorio - MC - 1512	
10	Egozcue - MC - 1109	
11	Esc. Industrial M. Such - MC - 1423	
12	Llorens Torres - MC - 1106	
13	Parques y Recreos - MC - 1002	
14	Puerto Nuevo - MC - 1520	
15	Taft - MC - 1105	
16	Viaducto TC - MC - 1100	
17	Baldrich - MC - 1422	
18	GIS System	IT/Telecom

VI. PREPA's 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 is implementing a comprehensive Enterprise Project Management (EPM) program. This program builds on work already in place at the Program Management Office (PMO) directorate, expands on it, and extends it across the entire enterprise.

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.

HILL.DAVID.E.1384235731

Michael P. Jacobs, P.E., C.C.E.
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 PREPA 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 will strengthen PREPA'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

PREPA's EPM program will 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

The EPM program's governance structure and key responsibilities are outlined in Image # and Table # respectively.

Figure 6.2 – EPM Program Organization Structure

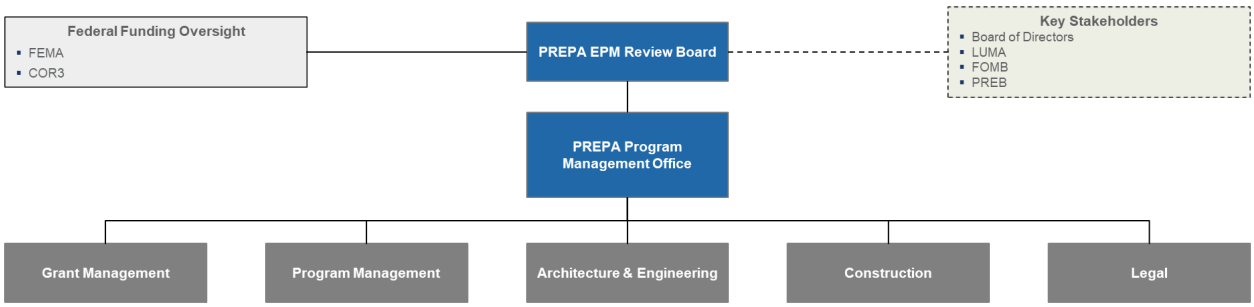


Table 6.1 – Program Organization Key Responsibilities by Role

Role	Responsibilities
PREPA EPM Review Board	▪ Ensure the selected portfolio of projects aligns with strategic objectives of the Government of Puerto Rico ▪ Provide direction to achieve the best outcomes for Puerto Rico ▪ Ensure consistent portfolio transparency and visibility across the enterprise. ▪ Require a single, standardized reporting source for key project information ▪ Establish a broad view across the portfolio of all PREPA projects ▪ Prioritize, select, and ensure projects work together as a cohesive and strategic portfolio
PREPA PMO	▪ Approve project deliverables prior to FEMA submission to ensure compliance with FEMA requirements and quality ▪ Provide advice and feedback to the project teams ▪ Support addressing and resolution of issues and risks, when elevated to PMO's attention ▪ Provide oversight of projects via periodic meetings with project teams ▪ Ensure the project has addressed objectives, benefits, and requirements before project close-out
Grant Management	▪ Develop Public Assistance (PA) funding sub-award application ▪ Validate the scope of work (SOW) for repair or replacement projects ▪ Work with FEMA to establish project worksheet and agree on a post fixed-cost estimate

Role	Responsibilities
	▪ Receive PA funding sub-award ▪ Confirm grant agreement to comply with applicable laws, regulations, and the provisions ▪ Coordinate all FEMA claims ▪ Apply for closeout, or a time extension if warranted ▪ Prepare and submit required internal and external reports (financial, performance, and other reports) ▪ Develop and submit reimbursements requests, and confirm payments
Program Management	▪ Support the identification all disaster-related projects ▪ Support project planning, formulation, and execution ▪ Support project prioritization in coordination with P3, PREPA executives, FEMA, COR3 and LUMA Energy, as directed by the CEO, the Governing Board, and PREB ▪ Coordinate site inspections and monitor all project sites ▪ Ensure adherence to program / project controls and standards by all project team members ▪ Respond to and mitigate risks ▪ Support closeout of projects
Architecture & Engineering	▪ Manage and develop architectural and engineering designs ▪ Understand PREPA's codes and standards ▪ Support development of document and bid packages ▪ Perform document evaluation during design-build construction process
Construction	▪ Provide construction controls such as project schedules, budget, and reporting systems and ensure compliance with PREPA's EPM program and process ▪ Ensure safety of construction team members and compliance with OSHA requirements ▪ Ensure project coordination on site, track progress and performance, leverage document controls, ▪ Monitor construction site risks and obtain proper permits for site
Legal	▪ Provide knowledge on all federal and local laws, regulation, and policy requirements applicable to PREPA's projects funded by federal grants ▪ Provide legal support for executing all grant award agreements ▪ and ensure compliance with PREPA's EPM program and process Negotiate terms and conditions with contractors ▪ Acquire adequate insurance coverage
Key Stakeholders	▪ Include PREPA's Governing Board, LUMA, FOMB, and PREB ▪ Provide a guidance, approval, and oversight of selected projects (Governing Board) ▪ Collaborate and align on priorities of 10-year plan with the System Remediation Plan (LUMA) ▪ Review 10-year plan and associated projects for alignment with fiscal plan (FOMB) ▪ Review 10-year plan and associated projects for alignment with IRP (PREB)

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.

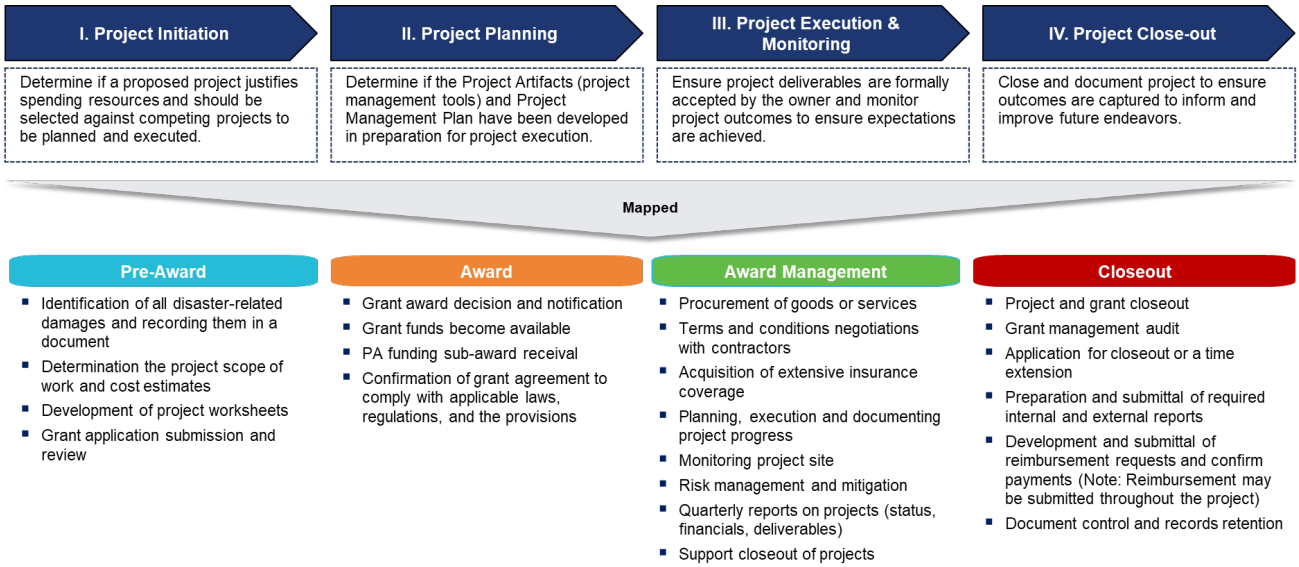
Figure 6.3 – COR3's Federal Grant Lifecycle

PREPA ensures 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 PREPA projects
- Holistic governance, oversight, and optimization of the portfolio of PREPA 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, PREPA has incorporated the key requirements and associated controls for the management of FEMA funds within the EPM Process. Image # below maps the PREPA's EPM process phases to COR3's Federal Grant Lifecycle and associated activities.

Figure 6.4 – PREPA's EPM Process Phases Mapped to Federal Grant Lifecycle



Centralized Information System

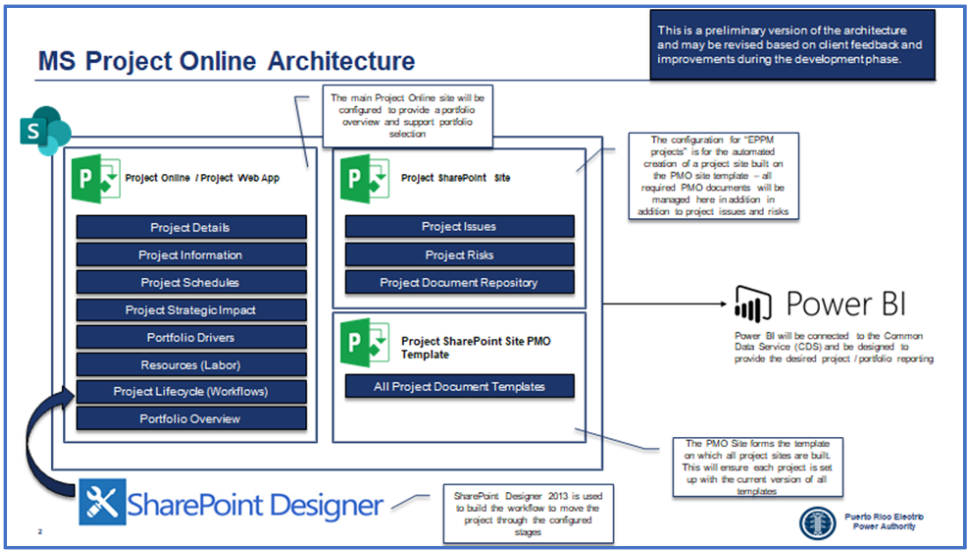
PREPA has selected Microsoft Project Online as its Enterprise Project Management Information System. This system is in use by a number of leading utilities and is relatively easy for a broad population to learn and use.

The system functional architecture (see Image #) 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 PREPA 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 6.5 below.

Figure 6.5 – EPM Centralized System Functional Architecture



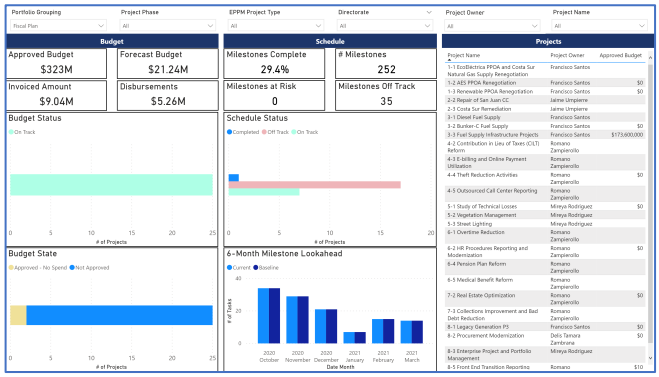
Project Controls

The EPM Program and Process has incorporated the following to ensure PREPA meets 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 6.6 below.

Figure 6.6 – Portfolio View Reporting – Milestones



VII. Appendix

I. Project Milestones for 2024-2030+

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 mid and long-term projects in this plan. Near-term project milestones are noted in section IV, H of this document.

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 an annual level for 2024 and beyond.

1. 2024

Table 7.1 – 2024 Milestones

#	Project Name	Asset Category
2024 – Milestone: Begin 30% Architecture and Engineering Design		
1	Cambalache Main Power Transformers	Generation
2	Synchronous condensers	
3	Retirement of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2)	
4	Demolition of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2, Costa Sur U1-U4)	
5	Dos Bocas Reservoir	Hydro and Dams
6	Caonillas Reservoir	
7	Toro Negro 2	
8	Garzas 1	
9	Yauco 2	
10	Caonillas Dam	

#	Project Name	Asset Category
11	Pellejas Dam	
12	16-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
13	Subst. Inter-Term Grid Concern Substations	Substations
14	Subst. Inter-Term Modernization & Hardening Substations	
15	Subst. Inter-Term Gen. & Switchyard Modernization Substations	
16	Hydro Generating Units - Generation Separation	
17	SCADA	IT/Telecom
18	Intermediate ESC Projects	Buildings
19	Intermediate Improvement and Construction	
2024 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Synchronous condensers	Generation
2	Demolition of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2, Costa Sur U1-U4)	
3	Dos Bocas Reservoir	Hydro and Dams
4	Caonillas Reservoir	
5	Toro Negro 2	
6	Guayabal Reservoir	
7	Guayabal Dam	
8	Matrullas Reservoir	
9	Garzas 1	
10	Garzas Reservoir	
11	Guamaní Canal	
12	Patillas Canal	
13	Guineo Reservoir	
14	Yauco 2	
15	Carite Dam	
16	Caonillas Dam	

#	Project Name	Asset Category
17	Pellejas Dam	
18	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamón Region	Distribution
19	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	
20	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	
21	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	
22	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayagüez Region	
23	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	
24	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	
25	Subst. Inter-Term Grid Concern Substations	Substations
26	Subst. Inter-Term Modernization & Hardening Substations	
27	Subst. Inter-Term Gen. & Switchyard Modernization Substations	
28	Hydro Generating Units - Generation Separation	
29	SCADA	IT/Telecom
30	Intermediate ESC Projects	Buildings
31	Intermediate Improvement and Construction	
2024 – Milestone: Begin Construction/Implementation		
1	Retirement of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2)	Generation
2	Early Warning System (Dams) Project	Hydro and Dams
3	Diversion Canal and Forebay	
4	Toro Negro 1	
5	Caonillas 1	
6	Guerrero Reservoir	
7	Juana Díaz Canal	
8	Garzas 2	
9	Río Blanco	

#	Project Name	Asset Category
10	Yauco 1	
11	Dos Bocas	
12	Dos Bocas Dam	
13	Patillas Dam	
14	Moca Canal	
15	Toro Negro Hydroelectric System Connection (4)	
16	Matrullas Dam	
17	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayagüez Region	Distribution
18	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	
19	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	
20	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamón Region	
21	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	
22	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	
23	Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	
24	SCADA	IT/Telecom
25	Intermediate ESC Projects	Buildings
26	Intermediate Improvement and Construction	
2024 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Guineo Dam	Hydro and Dams
2	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Distribution
3	Distribution Feeders - Short Term Group - Tier 1 - Bayamón Region	
4	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	
5	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	
6	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	
7	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	

#	Project Name	Asset Category
8	Distribution Feeders - Short Term Group - Tier 1 - Mayagüez Region	
9	Río Blanco TC Grid Constraint Mitigation	Substations
10	Aguirre Generation Separation	
11	Mayagüez Generation Separation	
12	Palo Seco Generation Separation	
13	Tapia GIS Rebuilt	
14	Gen. & Switchyard Modernization Substations - Project Description	
15	Grid Concern Substations - Project Description	
16	Modernization & Hardening Substations - Project Description	
17	Ponce Warehouse at Ponce ESC	Buildings
18	Ponce Calle Villa	
19	Palo Seco North & South	
20	Toa Baja Technical Services	

2. 2025

Table 7.2 – 2025 Milestones

#	Project Name	Asset Category
2025 – Milestone: Begin 30% Architecture and Engineering Design		
1	Lajas Lateral Canals	Hydro and Dams
2	Vivi Dam	
3	Adjuntas Dam	
4	37-Transmission Existing (115 & 230 kV)	Transmission
5	40-Transmission Existing (38 kV)	
6	Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	Distribution
7	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	
8	Distribution Feeders - Long Term Group - Tier 1 - Mayagüez Region	

#	Project Name	Asset Category
9	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	
10	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	
11	Distribution Feeders - Long Term Group - Tier 1 - Bayamón Region	
12	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	
2025 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Cambalache Main Power Transformers	Generation
2	Vivi Dam	Hydro and Dams
3	Adjuntas Dam	
4	37-Transmission Existing (115 & 230 kV)	Transmission
5	40-Transmission Existing (38 kV)	
6	Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	Distribution
7	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	
8	Distribution Feeders - Long Term Group - Tier 1 - Mayagüez Region	
9	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	
10	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	
11	Distribution Feeders - Long Term Group - Tier 1 - Bayamón Region	
12	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	
2025 – Milestone: Begin Construction/Implementation		
1	Synchronous condensers	Generation
2	Demolition of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2, Costa Sur U1-U4)	
3	Guajataca Reservoir	Hydro and Dams
4	Toro Negro 2	
5	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
6	Toro Negro 2 Penstock	
7	Garzas 1	
8	Main and Aguadilla Canal	

#	Project Name	Asset Category
9	Yauco 2	
10	Carite Dam	
11	Coamo Dam	
12	Matrullas Building	
13	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamón Region	Distribution
14	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	
15	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	
16	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	
17	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayagüez Region	
18	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	
19	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	
20	Subst. Inter-Term Grid Concern Substations	Substations
21	Subst. Inter-Term Modernization & Hardening Substations	
22	Subst. Inter-Term Gen. & Switchyard Modernization Substations	
23	Hydro Generating Units - Generation Separation	
2025 – Milestone: Begin COR3 and FEMA Project Closeout		
1	New Peaker Units	Generation
2	Demolition of Black Starts and Peaker Units	
3	Toro Negro 1	Hydro and Dams
4	Caonillas 1	
5	Guerrero Reservoir	
6	Toro Negro 2	
7	Juana Díaz Canal	
8	Garzas Dam	
9	Garzas 1	
10	Garzas 2	

#	Project Name	Asset Category
11	Río Blanco	
12	Yauco 2	
13	Yauco 1	
14	Dos Bocas	
15	Dos Bocas Dam	
16	Patillas Dam	
17	Moca Canal	
18	Toro Negro Hydroelectric System Connection (4)	
19	Matrullas Dam	
20	14-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
21	21-Transmission Existing (38 kV)	
22	12-Transmission Existing (115 & 230 kV)	
23	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Distribution
24	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	
25	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	
26	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	
27	Distribution Feeders - Short Term Group - Tier 2 - Mayagüez Region	
28	Distribution Feeders - Short Term Group - Tier 2 - Bayamón Region	
29	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	
30	San Juan 115kV GIS	Substations
31	Costa Sur Generation Separation	
32	Flooded Substations	
33	Intermediate ESC Projects	Buildings
34	Intermediate Improvement and Construction	

3. 2026

Table 7.3 – 2026 Milestones

#	Project Name	Asset Category
2026 – Milestone: Begin 30% Architecture and Engineering Design		
1	Lucchetti Reservoir	Hydro and Dams
2	Guayo Reservoir	
3	Lajas Irrigation Canals	
4	Guayo Dam	
5	CAGUAS ICEE (Former Caguas' Commercial)	Buildings
2026 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Lajas Lateral Canals	Hydro and Dams
2	Lajas Irrigation Canals	
3	Guayo Dam	
4	16-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
5	CAGUAS ICEE (Former Caguas' Commercial)	Buildings
2026 – Milestone: Begin Construction/Implementation		
1	Cambalache Main Power Transformers	Generation
2	Guajataca Dam - Study/Assessment - Detailed Design - Procurement	Hydro and Dams
3	Dos Bocas Reservoir	
4	Caonillas Reservoir	
5	Río Blanco Penstock	
6	Río Blanco Hydroelectric System Connection	
7	Guayabal Reservoir	
8	Guayabal Dam	
9	Garzas Reservoir	
10	Guamaní Canal	
11	Patillas Canal	

#	Project Name	Asset Category
12	Guineo Reservoir	
13	Caonillas Dam	
14	Pellejas Dam	
15	16-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
16	37-Transmission Existing (115 & 230 kV)	
17	40-Transmission Existing (38 kV)	
18	CAGUAS ICEE (Former Caguas' Commercial)	Buildings
2026 – Milestone: Begin COR3 and FEMA Project Closeout		
1	New combined-cycle near San Juan	Generation
2	Main and Aguadilla Canal	Hydro and Dams
3	Carite Dam	
4	Coamo Dam	
5	Matrullas Building	

4. 2027

Table 7.4 – 2027 Milestones

#	Project Name	Asset Category
2027 – Milestone: Begin 30% Architecture and Engineering Design		
1	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Distribution
2	Distribution Feeders - Long Term Group - Tier 2 - Bayamón Region	
3	Distribution Feeders - Long Term Group - Tier 2 - Mayagüez Region	
4	Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	
5	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	
6	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	
7	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	
8	Long Term ESC Projects	Buildings

#	Project Name	Asset Category
9	Long Term Commercial Office Projects	
10	Cataño Power Service Workshop	
11	Humacao Commercial Office	
2027 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Lucchetti Reservoir	Dams and Hydro
2	Guayo Reservoir	
3	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Distribution
4	Distribution Feeders - Long Term Group - Tier 2 - Bayamón Region	
5	Distribution Feeders - Long Term Group - Tier 2 - Mayagüez Region	
6	Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	
7	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	
8	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	
9	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	
10	Long Term ESC Projects	Buildings
11	Long Term Commercial Office Projects	
12	Cataño Power Service Workshop	
13	Humacao Commercial Office	
2027 – Milestone: Begin Construction/Implementation		
1	Matrullas Reservoir	Dams and Hydro
2	Vivi Dam	
3	Adjuntas Dam	
4	Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	Distribution
5	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	
6	Distribution Feeders - Long Term Group - Tier 1 - Mayagüez Region	
7	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	
8	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	
9	Distribution Feeders - Long Term Group - Tier 1 - Bayamón Region	

#	Project Name	Asset Category
10	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	
11	Long Term ESC Projects	Buildings
12	Long Term Commercial Office Projects	
13	Cataño Power Service Workshop	
14	Humacao Commercial Office	
2027 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Cambalache Main Power Transformers	Generation
2	Synchronous condensers	
3	Retirement of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2)	
4	Diversion Canal and Forebay	Dams and Hydro
5	Guajataca Reservoir	
6	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
7	Toro Negro 2 Penstock	
8	Garzas Reservoir	
9	Guamaní Canal	
10	Patillas Canal	
11	Caonillas Dam	
12	Pellejas Dam	
13	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayagüez Region	Distribution
14	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	
15	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	
16	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamón Region	
17	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	
18	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	

#	Project Name	Asset Category
19	Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	
20	Subst. Inter-Term Grid Concern Substations	Substations
21	Subst. Inter-Term Modernization & Hardening Substations	
22	Subst. Inter-Term Gen. & Switchyard Modernization Substations	
23	Hydro Generating Units - Generation Separation	
24	CAGUAS ICEE (Former Caguas' Commercial)	Buildings

5. 2028

Table 7.5 – 2028 Milestones

#	Project Name	Asset Category
2028 – Milestone: Begin 30% Architecture and Engineering Design		
1	Loco Reservoir	Dams and Hydro
2	Yahuecas Dam	
3	Lucchetti Dam	
4	Prieto Dam	
5	Loco Dam	
6	6-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
7	Subst. Long-Term Grid Concern Substations	Substations
8	Subst. Long-Term Modernization & Hardening Substations	
9	Subst. Long-Term Gen. & Switchyard Modernization Substations	
10	Santa Isabel ESC & Commercial Office	Buildings
2028 – Milestone: Submit Project to COR3 and FEMA for Review		
1	Loco Reservoir	Dams and Hydro
2	Yahuecas Dam	
3	Lucchetti Dam	

#	Project Name	Asset Category
4	Prieto Dam	
5	Loco Dam	
6	Subst. Long-Term Grid Concern Substations	Substations
7	Subst. Long-Term Modernization & Hardening Substations	
8	Subst. Long-Term Gen. & Switchyard Modernization Substations	
9	Santa Isabel ESC & Commercial Office	Buildings
2028 – Milestone: Begin Construction/Implementation		
1	Lajas Lateral Canals	Substations
2	Lajas Irrigation Canals	
3	Guayo Dam	
4	Santa Isabel ESC & Commercial Office	Buildings
2028 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Demolition of Generating Units (Aguirre U1-U2, Palo Seco U1-U4, San Juan U7-U10, Aguirre CC 1-2, Costa Sur U1-U4)	Generation
2	Early Warning System (Dams) Project	Dams and Hydro
3	Guayabal Reservoir	
4	Vivi Dam	
5	Adjuntas Dam	
6	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamón Region	Distribution
7	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	
8	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	
9	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	
10	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayagüez Region	
11	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	
12	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	
13	Cybersecurity Program Implementation	IT/Telecom

#	Project Name	Asset Category
14	FAN	
15	MPLS Network Deployment	
16	Physical Security Assessment for Facilities	
17	Monacillo Control Center	
18	Ponce Control Center	
19	Energy Management System (EMS) (OT/Backoffice)	
20	LMR Two-way radio P-25	
21	SCADA RTU Replacement	
22	Microwave PTP	
23	IT Corporate Network	
24	Meter & Automation Lab	
25	Long Term ESC Projects	Buildings
26	Long Term Commercial Office Projects	
27	Cataño Power Service Workshop	
28	Humacao Commercial Office	

6. 2029

Table 7.6 – 2029 Milestones

#	Project Name	Asset Category
2029 – Milestone: Begin 30% Architecture and Engineering Design		
1	28-Transmission Existing (115 & 230 kV)	Transmission
2	86-Transmission Existing (38 kV)	
2029 – Milestone: Submit Project to COR3 and FEMA for Review		
1	28-Transmission Existing (115 & 230 kV)	Transmission
2	86-Transmission Existing (38 kV)	
3	6-Transmission New Lines (38kV, 115 & 230 kV)	

#	Project Name	Asset Category
2029 – Milestone: Begin Construction/Implementation		
1	Lucchetti Reservoir	Hydro and Dams
2	Guayo Reservoir	
3	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Distribution
4	Distribution Feeders - Long Term Group - Tier 2 - Bayamón Region	
5	Distribution Feeders - Long Term Group - Tier 2 - Mayagüez Region	
6	Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	
7	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	
8	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	
9	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	
10	Subst. Long-Term Grid Concern Substations	Substations
11	Subst. Long-Term Modernization & Hardening Substations	
12	Subst. Long-Term Gen. & Switchyard Modernization Substations	
2029 – Milestone: Begin COR3 and FEMA Project Closeout		
1	Río Blanco Penstock	Hydro and Dams
2	Río Blanco Hydroelectric System Connection	
3	Guayabal Dam	
4	Guineo Reservoir	
5	Lajas Irrigation Canals	
6	Guayo Dam	
7	16-Transmission New Lines (38kV, 115 & 230 kV)	Transmission
8	Streetlights - All Regions	Distribution
9	Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	
10	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	
11	Distribution Feeders - Long Term Group - Tier 1 - Mayagüez Region	
12	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	
13	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	

#	Project Name	Asset Category
14	Distribution Feeders - Long Term Group - Tier 1 - Bayamón Region	
15	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	
16	Advanced Distribution Monitoring System (ADMS) (OT/Backoffice)	IT/Telecom
17	Infrastructure	
18	Santa Isabel ESC & Commercial Office	Buildings

7. 2030 and Beyond

Table 7.7 – 2030 and Beyond Milestones

#	Project Name	Asset Category
2030+ – Milestone: Begin 30% Architecture and Engineering Design		
1	Toa Alta Improvement and Construction	Buildings
2	San Juan -Santurce Building Complex	
2030+ – Milestone: Submit Project to COR3 and FEMA for Review		
1	Toa Alta Improvement and Construction	Buildings
2	San Juan -Santurce Building Complex	
2030+ – Milestone: Begin Construction/Implementation		
1	Loco Reservoir	Hydro and Dams
2	Yahuecas Dam	
3	Lucchetti Dam	
4	Prieto Dam	
5	Loco Dam	
6	28-Transmission Existing (115 & 230 kV)	Transmission
7	86-Transmission Existing (38 kV)	
8	6-Transmission New Lines (38kV, 115 & 230 kV)	
9	Toa Alta Improvement and Construction	Buildings

#	Project Name	Asset Category
10	San Juan -Santurce Building Complex	
2030+ – Milestone: Begin COR3 and FEMA Project Closeout		
1	Renewable Generation Projects	Generation
2	Battery energy storage	
3	Guajataca Dam - Study/Assessment - Detailed Design - Procurement	Hydro and Dams
4	Dos Bocas Reservoir	
5	Lajas Lateral Canals	
6	Caonillas Reservoir	
7	Lucchetti Reservoir	
8	Guayo Reservoir	
9	Matrullas Reservoir	
10	Loco Reservoir	
11	Yahuecas Dam	
12	Lucchetti Dam	
13	Prieto Dam	
14	Loco Dam	
15	37-Transmission Existing (115 & 230 kV)	Transmission
16	40-Transmission Existing (38 kV)	
17	28-Transmission Existing (115 & 230 kV)	
18	86-Transmission Existing (38 kV)	
19	6-Transmission New Lines (38kV, 115 & 230 kV)	
20	Distribution Automation - All Regions	Distribution
21	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	
22	Distribution Feeders - Long Term Group - Tier 2 - Bayamón Region	
23	Distribution Feeders - Long Term Group - Tier 2 - Mayagüez Region	
24	Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	
25	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	

#	Project Name	Asset Category
26	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	
27	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	
28	Subst. Long-Term Grid Concern Substations	Substations
29	Subst. Long-Term Modernization & Hardening Substations	
30	Subst. Long-Term Gen. & Switchyard Modernization Substations	
31	Advanced Metering Infrastructure (AMI)	IT/Telecom
32	SCADA	
33	Toa Alta Improvement and Construction	Buildings
34	San Juan -Santurce Building Complex	

J. List of Projects by Municipality

The following tables are designed to show which projects in the PREPA 10-Year Infrastructure Plan impact each municipality on the island. These tables currently include projects in the Distribution, Substations, Generation, Dams and Hydro, and Buildings asset categories. These tables will continue to be refined and projects from the remaining asset categories will be added in subsequent updates to this plan.

1. Adjuntas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 8202-01, 8202-02, 8202-03, 8203-01, 8203-02
Substations	Ceiba Baja TRF 7012	
Dams/Hydro	Adjuntas Dam	
Dams/Hydro	Garzas 1	
Dams/Hydro	Garzas 2	
Dams/Hydro	Garzas Dam	
Dams/Hydro	Garzas Reservoir	
Dams/Hydro	Guayo Dam	

Asset Category	Project Name	Notes
Dams/Hydro	Guayo Reservoir	
Dams/Hydro	Pellejas Dam	
Dams/Hydro	Yahuecas Dam	

2. Aguada

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 7201-02, 7201-04
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Mayaguez Region	Feeders: 7302-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 7201-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 7201-03, 7201-05
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 7302-02

3. Aguadilla

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 7002-02, 7004-02, 7004-03, 7005-01, 7005-02, 7005-04, 7-12-01, 7012-02
Substations	Victoria TC 7008	
Dams/Hydro	Guerrero Reservoir	
Dams/Hydro	Main and Aguadilla Channel	
Buildings	Aguadilla ESC	

4. Aguas Buenas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3701-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3701-02, 3701-04
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 3701-01

5. Aibonito

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3501-01, 3501-02, 3501-03, 3502-01, 3502-02

6. Añasco

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6101-01, 6101-02, 6101-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 6101-04
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 6101-03

7. Arecibo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 8010-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	Feeders: 8004-01, 8011-01

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8001-01, 8004-02, 8005-01, 8007-03, 8007-04, 8008-01, 8008-02, 8013-02, 8015-08
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 8001-02, 8004-03, 8004-04, 8007-01, 8010-02, 8010-03, 8011-02, 8011-04, 8013-01, 8014-08, 8015-09
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8001-04, 8002-01, 8002-02, 8002-03, 8002-04, 8002-05, 8013-03, 8013-04
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 8001-03, 8014-06, 8014-07, 8015-07
Substations	Cambalache Generation & Transmission Modernization and Hardening	
Dams/Hydro	Dos Bocas	
Dams/Hydro	Dos Bocas Dam	
Dams/Hydro	Dos Bocas Reservoir	
Generation	Cambalache Dike	
Generation	Cambalache Main Power Transformers	
Generation	Cambalache Power Plant Repairs	
Generation	Cambalache Unit 1 Repairs	
Buildings	Arecibo ESC	
Buildings	Arecibo Region Miscellaneous Repairs	
Buildings	Arecibo Regional Building	

8. Arroyo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4101-04
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4101-01, 4101-02, 4101-03

9. Barceloneta

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 8501-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	Feeders: 8504-01, 8504-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8501-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 8504-03
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 8501-03

10. Barranquitas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 9601-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 9601-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 9602-04, 9605-01, 9605-02
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 9602-03

11. Bayamón

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 1713-03, 1717-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Bayamon Region	Feeders: 1704-01, 1704-02, 1704-05, 1705-03, 1706-01, 1706-02, 1706-03, 1708-02, 1708-05, 1734-01

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamon Region	Feeders: 1704-03, 1705-01, 1708-04, 1709-03, 1710-01, 1711-04, 1716-03, 1719-15, 1720-07, 1734-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 1707-01, 1707-04, 1707-05, 1709-02, 1709-05, 1710-03, 1710-04, 1710-05, 1711-02, 1717-01, 1717-02, 1717-04, 1717-05, 1719-18
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Bayamon Region	Feeders: 1701-03, 1703-02, 1703-04, 1703-05, 1704-04, 1705-02, 1705-04, 1705-05, 1707-02, 1707-03, 1708-03, 1711-01, 1711-03, 1711-05, 1714-02, 1714-03, 1714-05, 1715-02, 1715-03, 1716-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 1701-01, 1703-01, 1713-04, 1713-05, 1715-05, 1716-02, 1719-16, 1719-19, 1720-08
Substations	Bayamon TC - MC - 1711	
Substations	Bayamon TC BKRS 230kV	
Substations	Caridad - MC - 1714	
Buildings	Bayamon Region Miscellaneous Repairs	

12. Cabo Rojo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 6703-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6702-01, 6704-02, 6704-03, 6705-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 6702-03, 6702-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Mayaguez Region	Feeders: 6703-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 6703-03, 6705-02

13. Caguas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3004-01, 3007-03, 3015-05, 3006-02, 3006-03, 3013-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 3004-03, 3007-02, 3007-04, 3009-01, 3014-01, 3014-02, 3014-04, 3006-01, 3008-03, 3010-01, 3010-04, 3013-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3009-02, 3009-03, 3009-04, 3014-03, 3016-05, 3006-04, 3006-05, 3008-01, 3013-01, 3013-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	Feeders: 3016-03, 3008-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 3004-04, 3005-01, 3005-02, 3005-03, 3007-01, 3015-06, 3010-02, 3010-03
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 3004-02, 3015-09
Substations	Caguas TC BKRS 115kV	
Buildings	CAGUAS ICEE (Former Caguas' Commercial)	
Buildings	Caguas Region Miscellaneous Repairs	

14. Camuy

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 7601-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 7601-04, 7601-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 7601-01

15. Canóvanas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 2401-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	Feeders: 2404-08
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 2401-02, 2402-02, 2402-03, 2404-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	Feeders: 2402-01, 2404-06, 2404-07
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	Feeders: 2401-03

16. Carolina

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 1618-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	Feeders: 1607-01, 1652-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 1607-03, 1618-01, 1619-01, 1646-02, 1646-05, 1652-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	Feeders: 1602-01, 1602-03, 1602-04, 1602-05, 1607-04, 1619-03, 1646-01, 1646-03, 1647-08, 1647-09, 1652-04, 1652-05, 1657-02, 1657-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	Feeders: 1602-02, 1618-03, 1647-06, 1647-07, 1647-10
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	Feeders: 1615-06, 1615-07, 1615-08, 1615-09, 1615-10, 1616-11, 1616-12, 1616-13, 1616-14, 1616-15, 1617-01, 1617-02, 1617-03, 1617-04, 1617-05, 1657-01, 1657-04, 1658-13, 1658-14, 1658-15
Buildings	Carolina Region Miscellaneous Repairs	

17. Cataño

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 1801-02, 1802-01, 1806-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 1801-03, 1806-01, 1806-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Bayamon Region	Feeders: 1801-05, 1802-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 1801-01
Substations	Catano Modernization and Hardening Project	
Buildings	Cataño Power Service Workshop	

18. Cayey

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3401-03, 3405-01, 3405-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 3401-01, 3401-02, 3403-01, 3406-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3405-02, 3406-02
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 3406-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 3402-05

19. Ceiba

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 2101-02

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 2101-01

20. Ciales

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 8701-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8701-02, 8701-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 8701-04

21. Cidra

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3601-02, 3601-04
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 3601-01, 3601-03, 3602-02, 3603-02, 3604-06, 3604-07
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3602-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	Feeders: 3602-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 3603-01
Substations	Sabanera TRF 3603	

22. Coamo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4602-01, 4603-01

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4601-01, 4601-04, 4602-03, 4603-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 4601-02, 4602-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 4602-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	Feeders: 4602-05
Substations	Coamo PDS Minor Rprs - 4603	
Dams/Hydro	Coamo Dam	

23. Comerío

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 9703-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 9703-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 9703-02

24. Corozal

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 9502-01, 9503-05
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Bayamon Region	Feeders: 9501-03, 9503-06
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamon Region	Feeders: 9501-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 9501-01, 9502-02, 9502-03

25. Culebra

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 3801-01, 3801-02
Substations	Culebra SUB 3801	

26. Dorado

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamon Region	Feeders: 9202-01, 9202-02, 9202-03, 9203-02, 9206-08, 9207-08
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 9201-01, 9201-02, 9202-04, 9203-03, 9203-04, 9206-10
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 9206-07, 9206-09, 9206-11, 9207-05, 9207-09

27. Fajardo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 2005-10
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 2001-03, 2005-09, 2006-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	Feeders: 2001-01, 2001-02, 2001-04, 2002-01, 2002-02, 2002-03, 2003-01, 2006-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	Feeders: 2003-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	Feeders: 2005-07, 2005-08, 2005-11

28. Florida

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8602-01, 8602-03
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 8602-02

29. Guánica

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 5602-02, 5602-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 5602-01

30. Guayama

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4003-01, 4003-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4001-03, 4002-02, 4003-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 4001-04, 4002-01, 4006-02, 4006-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 4002-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 4001-02
Dams/Hydro	Carite Dam	
Dams/Hydro	Guamani Channel	
Generation	Jobos Gas Plant Repairs	
Generation	New Peaker Units	

31. Guayanilla

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 5501-04
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 5501-02, 5501-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 5501-01
Substations	Costa Sur BKRS 115kV	
Substations	Costa Sur BKRS 230kV	
Substations	Costa Sur Generation & Transmission Modernization and Hardening	

32. Guaynabo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	Feeders: 1907-03, 1909-09
Distribution	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	Feeders: 1530-08, 1530-09, 1901-01, 1901-02, 1901-03, 1901-04, 1901-05, 1903-05, 1907-05, 1909-07, 1909-08, 1924-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	Feeders: 1530-06, 1530-07, 1530-10, 1903-01, 1903-02, 1903-03, 1907-04, 1924-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	Feeders: 1343-01, 1343-03, 1343-05, 1908-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	Feeders: 1343-02, 1343-04, 1924-02, 1924-05
Distribution	Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	Feeders: 1908-01, 1908-04, 1908-05, 1910-01, 1910-04, 1910-05, 1911-06, 1911-07, 1924-04
Substations	Guaynabo Pueblo Relocation	

33. Gurabo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3101-02, 3103-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 3101-03, 3101-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3102-01, 3102-02, 3103-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	Feeders: 3103-02
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 3101-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 3103-03, 3103-05

34. Hatillo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 7702-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	Feeders: 7701-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 7701-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 7702-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 7701-02, 7702-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 7701-04

35. Hormigueros

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6801-02, 6801-03, 6802-01, 6802-02, 6802-04, 6802-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 6801-01

36. Humacao

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 2602-01, 2603-08, 2605-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 2601-01, 2601-03, 2601-04, 2602-02, 2602-03, 2603-09, 2604-02, 2604-03, 2605-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 2604-01
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 2601-02, 2603-07
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 2603-10
Buildings	Humacao Commercial Office	

37. Isabela

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 7503-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	Feeders: 7503-05, 7505-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 7502-01, 7502-03, 7503-01, 7503-02, 7503-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 7502-02, 7502-04, 7504-01

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 7504-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 7505-01
Dams/Hydro	Diversion Channel and Forebay	
Dams/Hydro	Guajataca Dam	

38. Jayuya

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 8301-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 8301-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 8301-02, 8302-04, 8302-05
Substations	Jayuya Minor Rprs - 8301	

39. Juana Díaz

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 5804-02, 5817-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 5801-04, 5802-03, 5805-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 5801-01, 5802-01, 5802-02, 5802-04, 5803-02, 5804-01, 5817-01
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 5802-05
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	Feeders: 5801-02, 5808-01, 5808-02
Dams/Hydro	Juana Diaz Channel	

40. Juncos

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3201-02, 3201-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3202-01, 3205-07
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	Feeders: 3205-08
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders: 3201-01, 3201-03, 3205-09
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 3205-10

41. Lajas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6601-03, 6601-04, 6603-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 6601-02
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Mayaguez Region	Feeders: 6601-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 6603-03
Dams/Hydro	Lajas Irrigation Channels	
Dams/Hydro	Lajas Lateral Channels	

42. Lares

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 7902-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 7901-01, 7901-02, 7902-03, 7903-06

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 7901-03, 7901-04, 7902-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 7903-07
Substations	Bartolo TRF 7902	
Dams/Hydro	Prieto Dam	

43. Las Marías

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6201-01, 6201-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 6201-03

44. Las Piedras

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 2801-02, 2801-03, 2803-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 2803-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 2801-01, 2803-03

45. Loiza

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 2403-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	Feeders: 2403-02

46. Luquillo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 2201-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	Feeders: 2201-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	Feeders: 2201-02, 2201-03

47. Manatí

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Arecibo Region	Feeders: 8404-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	Feeders: 8404-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8401-02, 8401-03, 8404-01, 8404-02, 8405-01, 8405-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 8401-01
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 8401-04, 8405-02, 8405-04
Substations	Manati TC BKR 230kV	

48. Maricao

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 6301-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Mayaguez Region	Feeders: 6301-02, 6305-02, 6305-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6303-01, 6306-02

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Mayaguez Region	Feeders: 6301-03

49. Maunabo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4301-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4301-02, 4301-03, 4301-04

50. Mayagüez

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 6001-05, 6014-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Mayaguez Region	Feeders: 6010-02, 6010-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6001-03, 6002-05, 6005-02, 6008-04, 6010-01, 6012-02, 6012-03, 6012-05, 6014-01, 6015-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 6002-01, 6003-03, 6004-02, 6014-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Mayaguez Region	Feeders: 6001-01, 6001-04, 6002-04, 6003-01, 6004-03, 6004-05, 6005-01, 6007-02, 6007-04, 6007-05, 6008-02, 6008-05, 6012-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 6001-02, 6002-02, 6002-03, 6003-02, 6015-01
Substations	Mayaguez Generation & Transmission Modernization and Hardening	
Generation	Mayaguez Gas Plant Repairs	
Buildings	Mayaguez Region Miscellaneous Repairs	

51. Moca

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 7103-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Mayaguez Region	Feeders: 7101-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 7101-04, 7104-06
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 7101-03, 7103-01, 7103-04, 7104-05
Dams/Hydro	Moca Channel	

52. Morovis

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 8801-01, 8801-02, 8801-03, 8801-04

53. Naguabo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 2701-01, 2701-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 2702-01, 2702-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	Feeders: 2701-02
Substations	Rio Blanco Generation & Transmission Modernization and Hardening	
Substations	Rio Blanco TC Grid Constraint Mitigation	
Substations	Naguabo 2701	
Dams/Hydro	Rio Blanco Hydroelectric System Connection	

Asset Category	Project Name	Notes
Dams/Hydro	Rio Blanco Penstock	
Dams/Hydro	Rio Blanco	
Generation	Daguao Gas Plant Repairs	
Generation	New Peaker Units	

54. Naranjito

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 9802-04
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Bayamon Region	Feeders: 9801-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 9801-01, 9801-03

55. Orocovis

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 9902-01, 9902-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 9902-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 9901-01, 9901-02
Dams/Hydro	Guineo Dam	
Dams/Hydro	Guineo Reservoir	
Dams/Hydro	Toro Negro Hydroelectric System Connection (4)	
Dams/Hydro	Toro Negro Hydroelectric System Connection between Splitter box and Aceitunas Forebay	
Dams/Hydro	Matrullas Building	

Asset Category	Project Name	Notes
Dams/Hydro	Matrullas Dam	
Dams/Hydro	Matrullas Reservoir	
Dams/Hydro	Toro Negro 2	
Dams/Hydro	Toro Negro 2 Penstock	

56. Patillas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4201-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4201-02, 4201-03, 4201-04
Dams/Hydro	Patillas Channel	
Dams/Hydro	Patillas Dam	

57. Peñuelas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 5401-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 5403-01, 5401-02, 5401-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 5401-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 5402-01
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 5403-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	Feeders: 5402-02
Substations	Tallaboa 5402	

Asset Category	Project Name	Notes
Generation	New Black Start System at Costa Sur	

58. Ponce

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 5004-06, 5004-07, 5018-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 5001-02, 5002-01, 5002-03, 5002-04, 5004-09, 5005-03, 5007-01, 5012-03, 5012-04, 5013-01, 5013-02, 5018-02, 5018-05, 5021-01, 5021-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 5001-04, 5003-01, 5005-05, 5008-03, 5008-04, 5010-03, 5011-03, 5011-04, 5016-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 5013-03, 5016-02, 5018-01
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 5001-03, 5001-05, 5002-02, 5003-02, 5003-03, 5004-08, 5005-01, 5005-02, 5007-02, 5007-03, 5007-04, 5008-01, 5011-05, 5012-01, 5012-02, 5016-03, 5018-04, 5019-01, 5019-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	Feeders: 5003-04, 5004-10, 5005-04, 5007-05, 5010-04, 5010-06, 5011-01, 5011-02, 5012-05
Substations	Canas TC BKRS 115kV	
Buildings	Ponce Calle Villa	
Buildings	Ponce Region Miscellaneous Repairs	

59. Quebradillas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Arecibo Region	Feeders: 7402-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Arecibo Region	Feeders: 7402-03, 7402-05, 7403-02, 7403-03, 7404-06

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 7402-02, 7403-01

60. Rincón

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Mayaguez Region	Feeders: 7301-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Mayaguez Region	Feeders: 7301-01, 7301-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 7301-05, 7303-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 7301-02, 7303-02, 7303-03

61. Rio Grande

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 2301-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Carolina Region	Feeders: 2306-01, 2306-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 2301-03, 2302-03, 2305-01, 2305-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Carolina Region	Feeders: 2301-01, 2302-01, 2302-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Carolina Region	Feeders: 2305-03, 2305-04
Substations	Rio Grande Estates - CH - 2306	
Dams/Hydro	Icacos Dam	

62. Sabana Grande

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Carolina Region	Feeders: 6501-01, 6501-02, 6501-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Carolina Region	Feeders: 6501-03
Substations	Sabana Grande Minor Rprs - 6501	

63. Salinas

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4503-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4501-01, 4502-01, 4502-02, 4503-02, 4504-01, 4504-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 4501-03, 4501-04, 4501-05, 4504-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 4501-02
Substations	Aguirre BKRS 230kV	
Substations	Salinas Urbano Minor Rprs - 4501	
Substations	Aguirre Generation & Switchyard Modernization & Hardening	
Generation	New Black Start System at Aguirre	
Generation	Aguirre CC Main Power Transformer	
Generation	Aguirre Steam Plant Repairs	
Generation	Aguirre Unit 1 Major Overhaul	
Environmental	Whitefish Staging Area Aguirre Power Plant	

64. San Germán

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 6401-04, 6404-02, 6404-03, 6406-02, 6406-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Mayaguez Region	Feeders: 6401-01, 6401-02, 6401-03, 6404-01, 6404-04
Buildings	San Germán ESC	

65. San Juan

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	Feeders: 1117-11, 1346-02, 1620-02, 1303-01, 1303-02, 1303-05, 1330-01, 1529-15
Distribution	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	Feeders: 1346-03, 1346-04, 1346-05, 1416-05, 1421-03, 1519-02, 1526-02, 1526-03, 1531-02, 1531-03, 1531-05, 1201-02, 1206-01, 1303-04, 1330-02, 1342-02, 1342-04, 1404-06, 1404-07, 1520-02, 1520-04, 1525-01, 1525-03, 1529-11, 1529-13
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - San Juan Region	Feeders: 1014-18, 1105-04, 1106-04, 1111-01, 1111-02, 1113-02, 1114-01, 1115-05, 1118-10, 1119-04, 1301-03, 1327-10, 1336-08, 1348-06, 1401-07, 1414-05, 1416-02, 1416-03, 1416-04, 1424-06, 1519-03, 1526-04, 1620-04, 1201-01, 1206-03, 1206-04, 1342-01, 1342-05, 1520-01, 1520-05, 1525-02, 1525-05, 1529-12, 1803-02, 1803-03, 1803-04, 1803-05
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	Feeders: 1106-05, 1109-05, 1110-03, 1113-05, 1115-02, 1115-03, 1115-04, 1116-01, 1117-08, 1118-07, 1118-09, 1119-02, 1133-04, 1301-02, 1301-04, 1310-03, 1327-11, 1327-12, 1328-04, 1329-01, 1335-04, 1336-06, 1336-07, 1336-09, 1336-10, 1345-01, 1345-02, 1345-05, 1346-06, 1348-07, 1348-08, 1419-09, 1422-04, 1423-02, 1437-03, 1437-04, 1437-05, 1519-01, 1526-05,

Asset Category	Project Name	Notes
		1531-01, 1620-01, 1620-03, 1620-05, 1303-03, 1330-04, 1525-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - San Juan Region	Feeders: 1001-01, 1001-02, 1001-03, 1002-01, 1002-02, 1002-03, 1011-01, 1011-02, 1011-03, 1011-04, 1011-05, 1012-06, 1012-07, 1012-08, 1012-09, 1012-10, 1013-12, 1013-13, 1014-16, 1100-01, 1100-02, 1100-03, 1100-05, 1101-01, 1102-01, 1102-02, 1102-03, 1102-04, 1102-05, 1105-01, 1105-02, 1105-05, 1106-01, 1106-02, 1107-04, 1107-05, 1109-01, 1109-02, 1109-04, 1110-01, 1110-02, 1110-05, 1112-04, 1113-01, 1113-03, 1113-04, 1114-02, 1114-03, 1116-03, 1116-04, 1116-05, 1117-09, 1118-08, 1119-01, 1119-03, 1119-05, 1120-06, 1120-08, 1120-09, 1120-10, 1133-01, 1133-02, 1136-01, 1301-01, 1310-01, 1310-04, 1310-05, 1327-09, 1328-01, 1328-02, 1328-03, 1328-05, 1329-02, 1329-03, 1329-04, 1329-05, 1334-01, 1334-02, 1335-01, 1335-02, 1335-03, 1335-05, 1338-01, 1338-02, 1338-03, 1338-04, 1338-05, 1345-03, 1345-04, 1346-01, 1359-01, 1359-02, 1359-03, 1359-04, 1359-05, 1359-06, 1359-07, 1401-06, 1401-08, 1401-09, 1401-10, 1414-02, 1414-04, 1416-01, 1418-01, 1418-02, 1418-05, 1419-13, 1420-02, 1420-03, 1420-05, 1421-01, 1421-02, 1421-04, 1422-02, 1422-03, 1422-05, 1423-01, 1423-03, 1423-04, 1424-07, 1424-08, 1437-01,1512-04, 1519-04, 1521-01, 1521-02, 1526-01, 1206-02, 1342-03
Distribution	Distribution Feeders - Long Term Group - Tier 2 - San Juan Region	Feeders: 1414-01, 1414-03, 1418-03, 1418-04, 1419-10, 1419-11, 1419-12, 1420-01, 1420-04, 1421-05, 1423-05, 1437-02, 1512-05, 1519-05, 1404-08, 1404-09
Substations	Baldrich - MC - 1422	
Substations	Berwind TC- MC - 1336	
Substations	Cachete - MC - 1526	
Substations	Centro Medico 1 & 2 1327 & 1359	

Asset Category	Project Name	Notes
Substations	Condado - MC - 1133	
Substations	Covadonga GIS Minor Rprs - 1011	
Substations	Crematorio - MC - 1512	
Substations	Egozcue - MC - 1109	
Substations	Esc. Industrial M. Such - MC - 1423	
Substations	Fonalledas GIS Rebuilt 1401 1421	
Substations	Hato Rey TC GIS UG Terminal	
Substations	Isla Grande 1101	
Substations	Isla Grande GIS	
Substations	Las Lomas TRF 1525	
Substations	Llorens Torres - MC - 1106	
Substations	Parques y Recreos - MC - 1002	
Substations	Puerto Nuevo - MC - 1520	
Substations	Santurce Planta (Sect) 1116	
Substations	Taft - MC - 1105	
Substations	Tapia GIS Rebuilt	
Substations	Viaducto TC - MC - 1100	
Substations	San Juan 115kV GIS	
Generation	New Combined Cycle	
Generation	San Juan Steam Plant Repairs	
Generation	San Juan Unit 10 Repairs	
Buildings	San Juan -Santurce Building Complex	

66. San Lorenzo

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 3302-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 3301-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Caguas Region	Feeders: 3302-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Caguas Region	Feeders:3301-02, 3302-01, 3302-04
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 3301-03

67. San Sebastián

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Mayaguez Region	Feeders: 7801-01, 7801-03, 7802-03, 7802-04, 7805-11, 7805-13
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Mayaguez Region	Feeders: 7802-01
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Mayaguez Region	Feeders: 7801-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Mayaguez Region	Feeders: 7801-04
Dams/Hydro	Guajataca Reservoir	

68. Santa Isabel

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 4401-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 4401-01, 4401-02, 4401-04, 4402-02

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 4402-01
Buildings	Santa Isabel ESC & Commercial Office	

69. Toa Alta

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 9403-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamon Region	Feeders: 9401-01, 9401-02,9401-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 9403-01, 9405-05, 9405-09
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 9403-02, 9405-08
Buildings	Toa Alta Improvement and Construction	

70. Toa Baja

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 1718-02, 9404-02
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 1718-01, 1718-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Bayamon Region	Feeders: 9404-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 1718-04
Substations	Palo Seco Generation & Transmission Modernization and Hardening	
Generation	New Peaker Units	
Generation	Palo Seco Steam Plant Repairs	

Asset Category	Project Name	Notes
Buildings	Palo Seco North & South	
Buildings	Toa Baja Technical Services	

71. Trujillo Alto

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - San Juan Region	Feeders: 1204-03, 1204-04, 1204-05
Distribution	Distribution Feeders - Short Term Group - Tier 2 - San Juan Region	Feeders: 1203-01, 1203-02, 1203-03, 1205-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - San Juan Region	Feeders: 1204-02, 1205-02, 1205-03

72. Utuado

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Arecibo Region	Feeders: 8104-02
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Arecibo Region	Feeders: 8101-01, 8101-03, 8101-04, 8101-05, 8103-01, 8103-02, 8104-01
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Arecibo Region	Feeders: 8101-02, 8104-05
Dams/Hydro	Caonillas 1	
Dams/Hydro	Caonillas Dam	
Dams/Hydro	Caonillas Reservoir	
Dams/Hydro	Vivi Dam	

73. Vega Alta

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 9101-04
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Bayamon Region	Feeders: 9105-07
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamon Region	Feeders: 9105-08
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 9101-01, 9101-03, 9103-01, 9103-04
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Bayamon Region	Feeders: 9103-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 9105-06

74. Vega Baja

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Bayamon Region	Feeders: 9001-01, 9001-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Bayamon Region	Feeders: 9002-02, 9003-06
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Bayamon Region	Feeders: 9004-08, 9004-10
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Bayamon Region	Feeders: 9002-01, 9002-03, 9003-05
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Bayamon Region	Feeders: 9004-11
Generation	New Peaker Units	
Generation	Vega Baja Gas Plant Repairs	

75. Vieques

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Carolina Region	Feeders: 2501-01, 2501-02, 501-03
Substations	Vieques SUB 2501	

76. Villalba

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 5901-02
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 5901-01, 5901-03, 5902-02, 5902-03
Dams/Hydro	Guayabal Dam	
Dams/Hydro	Guayabal Reservoir	
Dams/Hydro	Toro Negro 1	

77. Yabucoa

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Caguas Region	Feeders: 2901-03
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Caguas Region	Feeders: 2901-01, 2901-02, 2901-04
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Caguas Region	Feeders: 2906-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Caguas Region	Feeders: 2906-03, 2906-04
Generation	New Peaker Units	
Generation	Yabucoa Gas Plant Repairs	

78. Yauco

Asset Category	Project Name	Notes
Distribution	Distribution Feeders - Short Term Group - Tier 1 - Ponce Region	Feeders: 5303-01
Distribution	Distribution Feeders - Short Term Group - Tier 2 - Ponce Region	Feeders: 5302-04, 5304-03
Distribution	Distribution Feeders - Intermediate Term Group - Tier 1 - Ponce Region	Feeders: 5302-01, 5302-02, 5304-01
Distribution	Distribution Feeders - Intermediate Term Group - Tier 2 - Ponce Region	Feeders: 5301-01, 5303-02, 5304-05, 5305-03
Distribution	Distribution Feeders - Long Term Group - Tier 1 - Ponce Region	Feeders: 5302-03, 5304-02
Distribution	Distribution Feeders - Long Term Group - Tier 2 - Ponce Region	Feeders: 5305-04
Dams/Hydro	Loco Dam	
Dams/Hydro	Loco Reservoir	
Dams/Hydro	Luchetti Dam	
Dams/Hydro	Luchetti Reservoir	
Dams/Hydro	Yauco 1	
Dams/Hydro	Yauco 2	

Attachment B

FEMA

PREPA Supplemental 90-Day Plan

December 2020

Puerto Rico Electric Power Authority

TABLE OF CONTENTS

I. Introduction

This document is a supplement to the PREPA 10-Year Infrastructure Plan that provides a summary overview of key next steps PREPA plans to take over the next 90 days to execute on its 10-Year Infrastructure Plan. Additional detail on PREPA's investment strategy, and the full set of infrastructure projects currently included in its project portfolio, can be found in the PREPA 10-Year Infrastructure Plan.

II. Overview of Activities for Next 90 Days

The content below summarizes next steps across the following six areas: 1) Federal Grant Management, 2) Funding and Reporting, 3) Environmental and Historic Preservation, 4) Engineering Management, 5) Project Management, and 6) Program Management.

Federal Grant Management

- Submit to COR3 and FEMA eight initial SOWs and cost estimates for review and comment
- Integrate hazard mitigation measures and environmental and historic preservation (EHP) compliance into recovery scopes; initiate project-specific collaborative meeting with EHP and Hazard Mitigation
- Review each near-term project for 406 hazard mitigation opportunities and formulate proposals
- Develop general potential benefit items for 406 hazard mitigation benefit cost analyses
- Continue to support and to work with PREPA 10-Year Infrastructure Plan project team to develop initial SOWs and cost estimates for near-term projects

Funding and Reporting

- Initiate A/E spend plan to support request for advancement on permanent projects, send COR3 procurement packages for review, and establish quarterly payment schedules
- Prepare request for reimbursement of completed work and management costs associated with the program
- Establish internal accounting and reporting mechanisms
- Submit quarterly financial reports on obligated 404 Projects and on processed projects under the FAASt
- Request amendment to Management Cost PW 1294 to include contracts awarded on grant management and program management activities
- Develop system study criteria (e.g., protection coordination, system impact study, etc..) for project planning and outage coordination

Environmental and Historic Preservation

- Develop project scoping doc per EHP request
- Provide support to EHP SHPO programmatic agreement development
- Respond to EHP data requests for the revised ESA
- Support review of RFPs to ensure EHP requirements are incorporated
- Review near-term projects as they develop to identify EHP requirements
- Develop public notification program to meet FAAST and EHP requirements

Engineering Management

- Execute and finalize architecture and engineering (A/E) contracts
- Initiate procurement-specialized designs studies (e.g., finalize and issue LiDAR Survey RFP to potential bidders)
- Develop and award A/E scope of work (SOW) for Early Warning System project
- Develop and award A/E SOW for 404 Peaker project
- Develop and award A/E SOW for 404 CCGT project
- Perform site visits for near-term projects
- Review and assess as-found documentation
- Track and review engineering standards
- Submit revised Design Criteria Documents (DCDs)
- Formulate and finalize A/E 30% design work template for projects funded through FEMA 428, and potentially 406, programs
- Commence design and specifications for FEMA 404 projects
- Continue formulation and finalization of design standards for near-term projects
- Commence formation of construction specifications for near-term projects

Project Management

- Continue preparation of SOWs for near-term projects
- Develop and award A/E SOW for Early Warning System project
- Develop and award A/E SOW for 404 Peaker project
- Develop and award A/E SOW for 404 CCGT project
- Develop major equipment procurement plan
- Submit 404 projects to PREPA stakeholders and commence monthly project meetings for 404 projects with PREPA stakeholders and A/E firms
- Commence development of work scope packages and RFPs for Access Road Stabilization projects in the Environmental asset category

Program Management

- Continue development of program management execution plan
- Continue identifying necessary staff and resources needed to execute program tasks
- Continue formulating Primavera (P6) layouts and schedule requirements
- Provide updates from P6 to PREPA scheduling system

- Implement Aconex document control system for document retention and program communication and vendor invoicing
- Develop program cost control system to track and report out on project/program budgets, forecasts, actuals, invoices, and change management for the program
- Develop stakeholder reporting criteria and initiate program reporting cycles for PREPA and other stakeholders

III. Projects for Immediate Submission

The following projects will be submitted to COR3 and FEMA concurrently with this document:

1. New Black Start System at Aguirre (Generation)
2. New Black Start System at Costa Sur (Generation)
3. Line 5400[1] (Transmission)
4. Vieques Feeders 2501-01, 2501-02, 2501-03 and Culebra Feeders 3801-01, 3801-02[2] (Distribution)
5. Vieques SUB 2501 (Substations)
6. Culebra SUB 3801 (Substations)
7. Rio Grande Estates - CH – 2306 (Substations)
8. Access Roads[3] (Environmental)

IV. Estimated Schedule of Additional Project Submissions for Next 90 Days

The table below shows the current set of projects estimated to be submitted in the first quarter of 2021, in addition to those noted above as being submitted concurrently with this document. Projects are grouped by asset category and are sequenced from largest to smallest investment amount. The estimation of project submission timing is based on the best information available to PREPA at the time of plan development. Additional information on assumptions impacting milestone timing can be found in the PREPA 10-Year Infrastructure Plan.

[1] This is part of the "21-Transmission Existing (38 kV)" project in the PREPA 10-Year Infrastructure Plan
[2] This is part of the "Distribution Feeders - Short Term Group - Tier 1 - Carolina Region" project in the PREPA 10-Year Infrastructure Plan
[3] This submission covers ten individual access road projects included in the PREPA 10-Year Infrastructure Plan

Table 1.1 – 2021 Q1 Project Submittal Milestone

#	Project Name	Asset Category
2021 Q1 – Milestone: Submit Project to COR3 and FEMA for Review		
1	New Combined Cycle – Performance and Financial Report	Generation
2	Cambalache Dike	
3	New Peaker Units – Performance and Financial Report	
4	San Juan 115kV GIS	Substations
5	Cataño Modernization and Hardening Project	
6	Isla Grande 1101	
7	Sabanera TRF 3603	
8	Bartolo TRF 7902	
9	Ceiba Baja TRF 7012	
10	Las Lomas TRF 1525	
11	Isla Grande GIS	
12	Jayuya Minor Rprs - 8301	
13	Salinas Urbano Minor Rprs - 4501	
14	Sabana Grande Minor Rprs - 6501	
15	Arecibo ESC	Buildings
16	Bayamón Region Miscellaneous Repairs	
17	Mayagüez Region Miscellaneous Repairs	
18	Arecibo Region Miscellaneous Repairs	
19	Caguas Region Miscellaneous Repairs	
20	Ponce Region Miscellaneous Repairs	
21	Carolina Region Miscellaneous Repairs	

Attachment C

Renewable Integration Study

(*This document has been submitted under seal*.)