

APPENDIX H.1 – BENEFIT TO VULNERABLE POPULATION AND ELECTRICAL POWER SYSTEM IMPROVEMENT PROJECTS

Executive Summary

The purpose of the Energy Grid Rehabilitation and Reconstruction (**ER1**) Cost Share Program is to meet the non-federal cost share of the Federal Emergency Management Agency (**FEMA**) Public Assistance (**PA**) allocation for the Puerto Rico Electric Power Authority (**PREPA**) Island-wide FEMA Accelerated Awards Strategy (**FAAST**) Project. It has a 10% cost-share requirement, or approximately \$1.5 billion in accordance with current estimates. Depending on available funding, ER1 may also consider the viability of matching non-federal cost shares of other federal grant-in-aid programs related to electrical system improvements and FEMA 406 mitigation projects once architectural and engineering design is completed. The use of ER1 for this matching strategy maximizes the potential for serving vulnerable populations at scale.

This Appendix provides an overview of the method, information, and criteria to be used in evaluating projects for the ER1 Program, prioritizing funding to projects that directly benefit to low-and moderate-income (**LMI**) persons, protected classes, and vulnerable populations. This method will be demonstrated using as example the obligated FEMA FAASt Project No. 174422 -Cataño Rebuild 1801 (Sub)- Cataño Modernization & Hardening, as selected from the list of potential ER1 projects included in this Appendix.

Impact to Vulnerable Populations Mapping

When planning for eligible match projects, their benefits are evaluated according to the area of improved electric grid service to residents. Where practicable, this area shall be determined by census boundaries such as municipal boundaries, census tracts, or a collection of census block groups.¹ Areas of benefit must be primarily residential unless the improvement is made to serve a critical facility or other component integral to the functioning of the electrical grid.

As noted in other studies and assessments, and this Action Plan, there were already pre-existing risks and vulnerabilities in the electrical grid systems. However, hurricanes Irma and María substantially exacerbated these risks and vulnerabilities, highlighting the need to strategize and develop projects with multi-scale, system-wide and area-wide impacts across all populations served by the grid. The example project and proposed list of ER1 projects referenced in this amendment are crucial to addressing these issues with additional prioritization focusing on populations served of importance to HUD. These populations are also the ones that will be most disproportionately affected by disaster events on the electric grid system.

Improvements to substations and generation and distribution lines of the Puerto Rico Electrical Power System will directly impact LMI communities and indirectly cascade

¹ The Census tracts and groups are available at <https://www.census.gov/cgi-bin/geo/shapefiles/index.php>.

benefits to the whole grid, benefiting LMI communities more susceptible to service disruptions and system failures across Puerto Rico. Also, the distribution line rehabilitation and hardening projects are critical for the integration of distributed generation that will improve reliability and resiliency under the ER2 Program implementation. To determine the impacts these projects will have on vulnerable populations and protected classes, those populations will be identified, and the extent to which proposed improvements will affect them.

Increased Reliability Criteria or Lower Electricity Rates

The main goals of the CDBG-DR Electrical Power System Enhancements and Improvements allocation is to improve reliability while rebuilding a grid system that ultimately serves all who need it without making costs prohibitive to household participation or system infrastructure repair and improvements. The requirements, particularly the LMI National Objective and eligible activities, have been programmatically designed to target grid reliability and/or affordability. Coupling grid improvements with LMI and vulnerable area targeting is vital to project prioritization and selection. In addition to documentation of vulnerability impacts, the Puerto Rico Department of Housing (**PRDOH**) will work closely with the utility to identify performance outcomes throughout the life of the project such as the System Average Interruption Duration Index (**SAIDI**), System Average Interruption Frequency Index (**SAIFI**) and/or Customer Average Interruption Duration Index (**CAIDI**). These outcomes may be reported in the Disaster Recovery Grant Reporting (**DRGR**) system as applicable.

Benefit to LMI Population

The ER1 Program funded by CDBG-DR assistance must meet one (1) of the two (2) national objectives. These are either the LMI or Urgent Need National Objective. For this allocation, eligible activities will be considered to meet the LMI National Objective if, at grant closeout, at least 70% of the funds, not including planning and administrative costs, meet one (1) of the following criteria:

- Provide at least 51% of the grantee's LMI residents with either a subsidized rate for electricity below that charged to other residential ratepayers or a lower rate for electricity than was charged before complete implementation of the CDBG-DR funding electrical power system improvements; or
- Measurably improve the reliability of the electrical power system in LMI areas that are primarily residential. Measurably improved reliability shall mean a documented decrease in power supply interruptions, excluding planned interruptions and interruptions caused by major events.

To calculate the funded project's beneficiaries, we will use HUD-provided census data, including the appropriate geography with both total persons and income, within the specified service area (**Area of Benefit**). The process is described in more detail below.

HUD provides grantees with statistical data based on U.S. Census data, known as Low- and Moderate-Income Summary Data (**LMISD**) tables, to facilitate the calculation of project activities' total and LMI beneficiaries. The use of the LMISD tables and/or income survey data to establish the number of total and LMI beneficiaries who live in the area that benefits from an activity, known as the activity's service area, is required by HUD. In addition, HUD also requires collecting demographic data for the population within the area of benefit, including race, ethnicity, head of the household type and gender. However, note that HUD encourages the use of LMISD when possible due to the difficulty and expense associated with individual income surveys.

The Adjusted LMI Data for Puerto Rico results in 77% of the local population being considered LMI and 93% of the overall population residing in LMI census tracts. Projects that can justifiably be shown to serve a substantial area of one (1) or more of these many LMI census tracts have a high likelihood of meeting the LMI Area Benefit (**LMA**) National Objective.

With grid service reliability and/or affordability as key outcomes, and because of the interconnected nature of the Electrical Power System of Puerto Rico that the ER1 Program will fund, areas of the island where a predominantly LMI population resides will inherently benefit from these improvements. In this way, the criteria for the National Objective of benefiting LMI areas are met. PRDOH has developed guidance and internal procedures based on HUD CDBG-funded project reporting for determining, confirming, and documenting this requirement.

To meet the grid reliability and/or affordability components for Electric Power System the subrecipient/awardee has two (2) options. The first option would require that LMI data be coupled with rate information for the period prior to project implementation and after project completion. The second option would be for the subrecipient to demonstrate reliability improvement by documenting power interruptions before and after project implementation and completion, excluding planned interruptions and interruptions caused by major events. The Program will coordinate data collection with LUMA Energy, LLC (**LUMA**), operator of the Transmission and Distribution Grid.

Potential projects for ER1 Evaluation

The CDBG disaster recovery and mitigation programs have been developed to focus on community investments for vulnerable populations including protected classes and LMI households across multiple scales. The ER1 Program is designed to maximize the benefit of federal grants as the local match program by positioning CDBG-DR relative to other federal funding streams. This approach will relieve the financial burden related to the recovery efforts of Puerto Rico's electrical grid and Puerto Rico's long-term infrastructure resilience needs.

This Appendix includes a list of potential projects for substations, distribution, transmission and, enabling technologies functional groupings identified and submitted by LUMA to

the Puerto Rico Energy Bureau (**PREB**) for approval.² The Central Power Generation Functional Grouping Projects are approved and reported by FEMA.³ **Not every project from the list will be eligible or will be selected for funding under the ER1 Program.** The selection of projects will be based on the direct and indirect impact on LMI persons, protected classes, and other vulnerable populations as they become available for funding after being authorized by FEMA and approved by PREB. As detailed throughout the Unmet Needs Assessment and as documented by FEMA in its approval of recovery funds related to the comprehensive recovery of the electrical system, the electrical grid must be rebuilt from the ground up. Proposed projects will ultimately be prioritized based on impact on LMI, protected classes, and other vulnerable population benefits and overall impact.

The ER1 Program is vital to complete the reconstruction and rehabilitation of Puerto Rico's electrical grid. In addition, a strengthened electrical grid is necessary to successfully execute other programs to increase its resiliency and reliability at all scales, such as: i) at the residential scale for the CDBG-DR Community Energy and Water Resilience Installations (**CEWRI**) Program, ii) at the municipal or regional level for the CDBG-MIT CEWRI Program, and iii) at the energy system level for ER1 and Electrical Power Reliability and Resilience Program (**ER2**).

Budget Distribution by Functional Grouping based on Potential FFAST Projects for Program Evaluation and Selection

The Action Plan assigned a budget allocation of \$500,000,000 and \$1,316,406,180 for the ER1 and ER2 Programs, respectively. This section focuses on illustrating how the ER1 Program will select projects that maximizes the use of the budgeted allocation by functional grouping as indicated in the following table:

FUNCTIONAL GROUPING	BUDGET DISTRIBUTION (%)	BUDGET DISTRIBUTION (\$MM)
Transmission and Distribution	70.0	350.0
Substations	9.7	48.5
Central Power Generation	11.3	56.5
Enabling Technology	9.0	45.0

Table 1 - Anticipated Budget Usage by Functional Groupings

² The list was extracted as of August 10, 2022 and is subject to change as additional projects are evaluated and approved. The list does not include the Central Power Generation functional grouping projects.

³ The Central Power Generation Functional Grouping Projects are approved and reported by FEMA and can be accessed at: <https://www.fema.gov/about/reports-and-data/faast>.

On August 10, 2022, LUMA provided the PREB with information about projects that may be eligible under the ER1 Program.⁴ From the list of more than 200 projects,⁵ so far nineteen (19) have been approved by FEMA for funding. A list of LUMA projects with FEMA funding obligation is summarized in the following table:

FEMA FAASt No.	Initial SOW	Project Title (Grants Portal)	Detailed SOW Estimate (\$MM)
542688	Distribution Streetlighting	FAASt - Aguada Streetlighting (Distribution)	22.6
542690	Distribution Streetlighting	FAASt - Maunabo Streetlighting (Distribution)	8.0
174422	Substations - Cataño - Rebuilt 1801	FAASt - Catano-Rebuild 1801 (Substation)	24.4
334329	Distribution Feeders - Ponce Short Term Group 2	FAASt Distribution Feeders - Ponce Short Term Group 2 (Distribution)	0.4
542517	Distribution Streetlighting	FAASt - Luquillo Distribution Streetlighting (Distribution)	10.6
542687	Distribution Streetlighting	FAASt - Lajas Streetlighting (Distribution)	13.0
179558	FAASt Manati TC - BRKS 230 kv (Substation)	FAASt - Manati TC - BRKS 230 kV - (Substation)	1.8
334323	Distribution Feeders - Ponce Short Term Group 1	FAASt Distribution Feeders - Ponce Short Term Group 1 (Distribution)	3.5
334488	Distribution Feeders - Caguas Short Term Group 4	FAASt [Distribution Feeders - Caguas Short Term Group 4] (Distribution)	2.5
542756	Distribution Streetlighting	FAASt [Streetlighting - Guanica] (Distribution)	6.7
542762	Distribution Feeders - Arecibo Short Term Group 2	FAASt [Distribution Feeders - Arecibo Short Term Group 2] (Distribution)	0.9
165225	Vieques SUB - 2501	FAASt-Substation 2501 Vieques (Substation)	1.9
165209	Culebra SUB 3801	FAASt-Substation 3801 Culebra (Substation)	2.0
334527	Distribution Feeders - Caguas Short Term Group 8	FAASt [Distribution Feeders - Caguas Short Term Group 8] (Distribution)	0.1
673691	Multiple	FAASt [Equipment and Materials]	656.1
673838	Distribution Pole & Conductor Replacement	FAASt [Distribution Pole and Conductor Repair - San Juan Group 2] (Distribution)	0.41
673839	Distribution Pole & Conductor Replacement	FAASt [Distribution Pole and Conductor Repair-Bayamon Group 2] (Distribution)	0.04
673848	Distribution Pole & Conductor Replacement	FAASt [Distribution Pole and Conductor Repair-Carolina Group 3] (Distribution)	0.06
334468	Line 2200 Dos Bocas HP to Dorado TC	FAASt [Line 2200 Dos Bocas HP to Dorado TC] (Transmission)	1.46
TOTAL FEMA FUNDING OBLIGATION			756.47
POSSIBLE COST SHARE ESTIMATE (10% OF TOTAL)			75.65

⁴ LUMA is the operator of the Transmission and Distribution Grids. See, Exhibit2_2022-08-10_Project-Listing under PREB Orders and Resolutions, Docket Number: NEPR-MI-2021-0002, In Re: Review of the Puerto Rico Electric Power Authority's 10 Year Infrastructure Plan- December 2020, FEMA Approved Tab, available at https://energia.pr.gov/wp-content/uploads/sites/7/2022/08/Exhibit2_2022-08-10_Project-Listing.xlsx.

⁵ *Id.*, Table, FAASt Numbers Tab. See also, PREPA's 10 Year Infrastructure Plan, at <https://energia.pr.gov/wp-content/uploads/sites/7/2021/07/20210706-Joint-Motion-Submitting-Updated-10-Year-Infrastructure-Work-Plan.pdf>.

Table 2-List of obligated projects by FEMA as of August 10, 2022. The Cataño substation project is highlighted as the example project reviewed under this appendix.

Not every project from the potential list of projects or the projects already obligated by FEMA may be eligible under the ER1 Program. However, for purposes of illustrating how the eligible projects may be selected according to ER1 budget limits, PRDOH has developed the following tables that illustrate how projects may be selected until the budget allocation is maximized by functional groupings.

It is important to note that, since projects will be selected according to the eligibility criteria defined in the Action Plan, as they are submitted by LUMA and PREPA for ER1 Program consideration,⁶ the tables include only potentially eligible projects for budget by functional components for illustration purposes. The final selection of projects is contingent on the distribution limits and more detailed information to be provided by LUMA, before they are submitted for PRDOH evaluation, selection, and funds distribution.

Functional Grouping: Transmission and Distribution; Budget: \$350 MM⁷

Initial SOW	FEMA FAASt No.	Cost-share (\$MM)
FAASt - Line 36100 - Dos Bocas HP to Monacillos TC (Transmission)	167446	11.55
FAASt - Line 36200 - Monacillos TC to Juncos TC (Transmission)	167443	4.27
FAASt - Transmission Line 51300 - Ponce TC to Costa Sur SP TC	166707	2.61
FAASt Aguas Buenas TC to Caguas TC - 39000 (Transmission)	177191	0.97
FAASt Canovanas TC to Sabana Llana TC - 36800 (Transmission) FAASt-Canovanas TC to Palmer-Fajardo TC-36800 (Transmission)	180326	7.03
FAASt - Garzas 1 HP to Garzas 2 HP - Line 1100 (Transmission)	176954	0.36
FAASt - Guaraguao TC to Comerio TC - Line-4100 (Transmission)	177134	2.53
FAASt - Palo Seco SP to Catano SectLine - 9500 (Transmission)	176913	0.67
FAASt - Ponce TC to Jobos TC - 100 (Transmission) FAASt - Ponce TC to Jobos TC - 200 (Transmission)	180052	15.66
FAASt - San Juan SP to Catano SectLine - 8200 (Transmission)	176971	0.81
FAASt Transmission - Line 50100 - Cambalache GP TC to Manati TC (Transmission)	167508	4.35
FAASt Transmission - Line 37800 - Jobos TC to Cayey TC Transmission - Line 37800 - Cayey TC to Caguas TC (Transmission)	166860	5.20
FAASt Transmission - Line 37800 Caguas TC to Monacillos TC (Transmission)	166904	3.34
FAASt – Transmission – Line -37100-Costa Sur-ST_Acacias-TC	167168	9.20

⁶ PREPA will submit the projects for the Central Power Generation Functional Grouping.

⁷ Similar to other functional groupings, there are other projects not included in this exercise. Other projects that may be filed after August 10, 2022, will be selected according to the distribution method and national objectives requirements.

Initial SOW	FEMA FAASf No.	Cost-share (\$MM)
Transmission - Line 36400 - Dos Bocas HP to Ponce TC	168483	8.74
Transmission - San Juan 115-kV Underground Transmission Loop	168226	1.00
Transmission – Line 5400 – Rio Blanco HP to Daguao TC to Punta Lima TO to Vieques 2501 to Culebra 3801	165213	7.31
Distribution Feeders - Arecibo Short Term Group 1	436616	5.36
Distribution Feeders - Bayamon Short Term Group 1	334473	8.50
Distribution Feeders - Bayamon Short Term Group 2	334474	1.04
Distribution Feeders - Bayamon Short Term Group 3	334475	6.57
Distribution Feeders - Caguas Short Term Group 1	334420	5.99
Distribution Feeders - Caguas Short Term Group 2	334443	11.20
Distribution Feeders - Caguas Short Term Group 3	334452	8.21
Distribution Feeders - Caguas Short Term Group 4	334488*	0.25
Distribution Feeders - Caguas Short Term Group 8	334527*	0.01
Distribution Feeders - Ponce Short Term Group 1	334323*	0.35
Distribution Feeders - Ponce Short Term Group 2	334329*	0.04
Line 2200 Dos Bocas HP to Dorado TC	334468*	0.15
Line 3000 Monacillos TC to Juncos TC	334482	9.04
Line 3100 Monacillos TC to Daguao TC	334470	11.33
Line 500 Ponce TC to Costa Sur SP	334334	3.66
Line 8900 Monacillos TC to Adm. Tribunal Apelaciones	334469	1.15
115 kV Transmission Priority Poles and Structures Replacements		31.88
230 kV Transmission Priority Poles and Structures Replacements	668669	3.13
38 kV Transmission Priority Poles and Structures Replacements →	668583	37.88
38 kV Transmission Priority Poles and Structures Replacements →	668592	
Distribution Feeders - Arecibo Short Term Group 2	542762*	0.09
Distribution Feeders - San Juan Short Term Group 3	546374	2.73
Distribution Pole & Conductor Replacement → FAASf [Distribution Pole and Conductor Repair - San Juan Group 2] (Distribution)	673838*	0.05
Distribution Pole & Conductor Replacement → FAASf [Distribution Pole and Conductor Repair-Bayamon Group 2] (Distribution)	673839*	
Distribution Pole & Conductor Replacement → FAASf [Distribution Pole and Conductor Repair-Carolina Group 3] (Distribution)	673848*	
Distribution Pole & Conductor Replacement →	673771	59.95
Distribution Pole & Conductor Replacement →	673772	
Distribution Pole & Conductor Replacement →	673774	
Distribution Pole & Conductor Replacement →	673775	

Initial SOW	FEMA FAAST No.	Cost-share (\$MM)
Distribution Pole & Conductor Replacement →	673795	
Distribution Pole & Conductor Replacement →	673818	
Distribution Pole & Conductor Replacement →	673836	
Distribution Pole & Conductor Replacement →	673843	
Distribution Pole & Conductor Replacement →	673844	
Distribution Pole & Conductor Replacement →	673847	
Distribution Pole & Conductor Replacement →	674072	
Distribution Pole & Conductor Replacement →	674083	
Distribution Pole & Conductor Replacement →	674088	
Distribution Pole & Conductor Replacement →	674092	
Distribution Pole & Conductor Replacement →	674096	
Distribution Pole & Conductor Replacement →	674098	
Distribution Pole & Conductor Replacement →	678985	
Distribution Pole & Conductor Replacement →	678988	
Distribution Pole & Conductor Replacement →	679127	
Distribution Pole & Conductor Replacement →	679133	
Distribution Pole & Conductor Replacement →	679134	
Distribution Pole & Conductor Replacement →	679149	
Distribution Pole & Conductor Replacement →	679153	
Distribution Pole & Conductor Replacement →	679457	
Distribution Pole & Conductor Replacement →	679458	
Distribution Pole & Conductor Replacement →	679025	
Distribution Pole & Conductor Replacement →	679026	
Distribution Pole & Conductor Replacement →	679033	
El Yunque 2305-01 Supply	546386	1.46
Line 13300 Bayamon TC to Plaza del Sol	547350	0.54
Line 2700 Victoria TC to Quebradillas Sect.	547259	4.13
Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	547269	0.31
Line 3600 Monacillos TC to Martin Peña TC	547221	4.00
Line 11100 Canovanas Sect. to GOAB 11115	551067	0.38
Line 11400 Barceloneta TC to Florida TO	547226	1.38
Line 1200 Mayaguez GP to Yauco 2 HP	547160	5.54
Line 1500 Mayaguez GP to GOAB 1515	547342	5.86
Line 2400 Dos Bocas HP to America Apparel	547251	2.15
Line 36200 Fajardo to Rio Blanco	548598	4.43
Line 4000 Comerio HP to Escuela Francisco Morales	550070	2.23
Line 600 Caguas TC to Gautier Benitez Sect.	550019	1.01
Line 6700 Martin Peña TC to Villamar Sect.	550896	0.60

Initial SOW	FEMA FAAS ^t No.	Cost-share (\$MM)
Line 9100 Guaraguao TC to Bayamon Pueblo Sect.	551911	0.51
Line 9700 Palo Seco SP to Bay View Sect.	550902	0.23
TOTAL COST-SHARE TRANSMISSION AND DISTRIBUTION		328.88

Table 3 - Transmission and Distribution Projects for Consideration

(*) – Project with FEMA obligated funds

Functional Grouping: Substations; Budget: \$48.5MM⁸

Initial SOW	FEMA FAAS ^t No.	Cost-share (\$MM)
Rio Grande Estates - CH - 2306	165268	0.37
Substations - Tapia GIS Rebuilt - Equipment Repair & Replacement	169495	2.30
Substations - Cataño – Rebuilt 1801	174422*	2.44
Substations – Bayamon TC – MC-BKRS-Y1	169500	0.57
Culebra SUB 3801	165209*	2.00
FAAS ^t Caridad – XFMR MC 1714 (Substation)		0.55
FAAS ^t - Viaducto TC - MC 1100 - Equipment Repair & Replacement (Substations)	169276	0.40
Substations – Aguirre TC - BRKS	178503	1.22
Substations - Llorens Torres MC 1106 - Equipment Repair & Replacement	169058	0.40
Substations–Cachete – MC 1526	178577	0.40
Substations - Centro Medico 1327/1359 Equipment Repair & Replacement	169266	1.17
Substations–Costa Sur SP TC – Equipment Repair and Replacement	169896	0.36
Vieques SUB 2501	165225*	0.19
Acacias 6801 TC Relocation	547344	2.91
Arecibo Pueblo 8002 Relocation	547187	1.71
Baldrich - 1422	550894	1.05
Bayview Sectionalizer 1802 Relocation	551100	1.67
Berwind TC – 1336	550162	1.34
Caguas TC	550771	0.25
Cambalache TC Relocation	547247	3.07
Charco Hondo 8008 Relocation	547273	1.63

⁸ The substations included in this exercise are selected according to the distribution method and the projects submitted on August 10, 2022, by LUMA and listed in Section D of this Appendix. Other substations with similar relevance must be attained for the electrical grid's reliability and resiliency and were not included due to the high estimated budget for the improvements.

Initial SOW	FEMA FAAST No.	Cost-share (\$MM)
Conquistador – CH	550106	0.51
Crematorio - 1512	551918	1.06
Dorado TC Relocation	551916	4.01
Egozcue – 1109	547243	1.05
Esc. Industrial M. Such - 1423	550099	1.06
Fonalledas GIS Rebuilt 1401 1421	550972	3.14
Monacillo TC	550950	0.10
Pampanos Relocation	550498	1.63
Parques y Recreos - 1002	550980	0.77
Puerto Nuevo - 1520	551912	1.06
San Jose Relocation	547271	1.70
Santurce Planta (Sect) 1116	550998	0.99
Tallaboa 5402	547241	0.69
Victoria TC 7008	547343	0.55
Isla Grande 1101	673920	0.06
Aguirre TC - Phase II		4.10
TOTAL COST-SHARE SUBSTATIONS		48.48⁹

Table 4 - Substation Projects for Consideration

(*) – FAASt project with FEMA obligated funds

Functional Grouping: Enabling Technology; Component Budget: \$45.0 MM¹⁰

Initial SOW	FEMA FAAST No.	Cost-share (\$MM)
Energy Management System (EMS)	657300	4.20
Microwave Point-to-Point	662238	1.75
SCADA Remote Access and RTU Replacements →	551925	3.00
SCADA Remote Access and RTU Replacements →	551926	

⁹ The total cost-share can be less than the budget allocated for each functional grouping. Any remaining budget may be reallocated between components subject to the Fungibility Threshold established in the Action Plan.

¹⁰ Similar to other functional groupings, there are other enabling technology projects not included in this exercise. Nevertheless, the selection of the enabling technology depends on the distribution limit and a more detailed and complete exercise made by LUMA before submission and filing for PRDOH evaluation and funds distribution.

Initial SOW	FEMA FAAST No.	Cost-share (\$MM)
SCADA Remote Access and RTU Replacements →	551927	
SCADA Remote Access and RTU Replacements →		
Telecom Infrastructure →	673292	9.65
Telecom Infrastructure →	678800	0.00
Telecom Infrastructure →	679035	0.00
Transport Network	551963	18.50
Two Way Land Mobile Radio Network	675406	4.62
Cybersecurity Implementation Program	668665	2.45
TOTAL COST-SHARE ENABLING TECHNOLOGY		44.17

Table 5 - Enabling Technology Projects for Consideration

Functional Grouping: Central Power Generation; Budget: \$56.5 MM

The Central Power Generation (PREPA projects) are limited to 11.3%, equivalent to \$56.5 MM of the \$500MM total budget for ER1. For illustration purposes, although PRDOH may select projects for this grouping that utilize the total available funds available, four (4) potential projects were identified for this grouping. Selection of projects for this functional grouping, as well as the other projects provided as an illustration for grouping categorization above, will be contingent on the projects that will be submitted by LUMA and PREPA¹¹, and selected by PRDOH, as they are approved by PREB and obligated by FEMA.¹²

Initial SOW	FEMA FAAST No.	Cost-share (\$MM)
Mayaguez Hydro-Gas Power Plant Permanent Repairs	663385	1.82
Aguirre Power Plant 002 Units 1 & 2 Projects	669233	1.49
Cambalache Power Plant Permanent Repairs	663383	0.10
Aguirre Power Plant 001 Infrastructure Projects	669498	0.30
TOTAL COST-SHARE CENTRAL POWER GENERATION		3.71

Fungibility Threshold and Reallocation of Budgets Between Components

As the fungibility threshold establishes in the Action Plan, PRDOH will reallocate budgets between components at 10% or less for each component without amendments.

¹¹ PREPA will submit projects for the Central Power Generation Functional Grouping Consideration.

¹² The FEMA approved projects for the Central Power Generation Functional Grouping may be accessed at [FEMA Accelerated Awards Strategy \(FAAST\) | FEMA.gov](#), FAASt Cost Estimates.

Adjustment equal to more than 10% but 25% or less would trigger a non-substantial amendment; while adjustments greater than 25% would require a substantial amendment.

According to the budget scenarios described above, there is a total remaining budget of \$74.76MM, described by each functional grouping in Table 7:

COST-SHARE SUMMARY FROM POTENTIAL PROJECTS FOR CONSIDERATION¹³		
FUNCTIONAL GROUPING	COST-SHARE (\$MM)	REMAINING BUDGET (\$MM)
Transmission and Distribution	328.88	21.12
Substations	48.48	.02
Enabling Technology	44.17	.83
Central Power Generation	3.71	52.79
TOTAL COST-SHARE (\$MM)	425.24	74.76

Table 7 - Remaining Budget by Functional Grouping

In the Transmission and Distribution grouping, the remaining budget of \$21.12MM could be reallocated between components with no amendment necessary since it only represents 6% of the \$350MM for that component. Similarly, no amendment would be required for the remaining budget for Substations and Enabling Technology groupings, as they only represent less than 1% and 1.8%, respectively.¹⁴ Therefore, the remaining budget of \$21.97MM for the Transmission and Distribution, Substations, and Enabling Technology groupings could be reallocated between all the other components without triggering a substantial amendment to the Action Plan. However, in the example of the Central Power Generation projects, the remaining budget of \$52.79MM would require a substantial amendment for its reallocation since it represents more than 25% of that component.¹⁵ These examples illustrate how PRDOH may reallocate the budgets between components, and if the instances where a substantial amendment may be required per the Electrical Systems Enhancements and Improvements Action Plan.

The culmination of the process of presentation and evaluation of the FAAS^t projects with obligated funds from FEMA should be the immediate step to achieve the beginning of the execution phase of ER1. PREPA and LUMA must submit projects to PRDOH that meet the National Objectives and align with the budget restrictions established for each Functional Grouping.

A Master Schedule showing the sequence of the main phases (Design, Procurement, Construction, etc.) of all prioritized projects eligible for the ER1 Program should be

¹³ See, Tables 3, 4, and 5 of this Appendix for a detailed list of the potential projects for consideration by grouping.

¹⁴ For the Substations and Enabling Technology Functional Groupings, the remaining budget are \$20,000 (\$48.48MM of the \$48.50MM budget) and \$83,000 (\$44.17MM of the \$45MM budget), respectively. See Table 7 for Substation and Enabling Technologies Functional Groupings.

¹⁵ For the Central Power Generation component, the remaining budget is 52.79MM of the 56.5MM, equals to 93.4% of that grouping. See, *Table 7- Enabling Technology Projects for Consideration*.

submitted to PRDOH. The Master Schedule will allow the alignment of projects under the ER1 Program.

The following Cataño Modernization & Hardening Substation 1801, a FEMA obligated project, serves as an illustration of how benefit to vulnerable populations and protected classes will be integrated into the methodology described above to evaluate and prioritize appropriate projects for ER1 funding. Individual projects on the potential projects¹⁶ list may be aggregated where it makes sense and is feasible. In that case, LMI benefit will be considered and evaluated for the combined project as a whole rather than for each individual sub-component.

Cataño Modernization & Hardening Project – FFAST CATAÑO REBUILD 1801 (SUB)

An examination of one proposed ER1 project, Improvements for the Cataño Substation 1801, impact on LMI and protected classes is assessed. Generally, projects submitted for Substations as an asset category comprise a series of Transmission Centers and Distribution Substations as facilities within the asset category ranging in all voltage classes found on the Power System. Substations also house Power Grid control, protection, and monitoring equipment. They contain various configurations of Transmission and Distribution lines, feeders, and circuits originating and terminating within the same facilities all of which are interconnected and form the overall power grid.¹⁷

In the simplest of terms, a substation receives power from transmission lines, mostly over long distances from electrical generation source locations. It has transformers, breakers, switches and interconnected feeders to supply power to the electrical loads. The substation converts the power voltage (lowers) to a more suitable voltage for distribution to service locations. They also serve as critical node where specific controls, monitoring, and protection equipment are also located within the grid. **Failure of a substation within a transmission and distribution system can result in service disruptions, temporary or permanent, depending on the failure, potentially affecting the whole grid and causing blackouts.** Evolutions in electrical grid technologies over time have yielded current substation features and capabilities, including:

List 1-Substation and Ancillary Components and Functions

- Stability control in steady state and transient conditions
- Power flow control to minimize system congestion
- More efficient delivery of power over long distances
- Sharing of power between asynchronous systems
- Monitoring to improve control, protection, and maintenance

¹⁶ See, PREPA's 10 Year Infrastructure Plan, at <https://energia.pr.gov/wp-content/uploads/sites/7/2021/07/20210706-Joint-Motion-Submitting-Updated-10-Year-Infrastructure-Work-Plan.pdf>.

¹⁷ See **Table 3.4 - Strategic Projects, Transmission, Substation, and Distribution Infrastructure** in the *PREPA 10-year Infrastructure Plan* in this Action Plan as Appendix G.7

-
- Voltage control for energy conservation and managing violations, and
 - Increased reliability through surge protection and limiting fault currents¹⁸.

Fine grained extrapolation of systemic and beneficiary impacts can be drawn from each function as described in the list above. However, to meet reporting requirements, PRDOH will be monitoring data provided by LUMA and/or PREPA to substantiate compliance with the National Objective for ER1.

Due to the network composition and definition of assets by the utility, the geographical extent of benefits and impacts extends beyond those immediately impacted by the potential construction, and those receiving service contingent upon the operation of this substation and its ancillary interconnected and functionally dependent components.

Following the processes described above, the methodology presented, will explain how similar projects will be selected and evaluated, and how LMI and other vulnerable populations, including protected classes, are served, and ultimately impacted by these projects. Due to the interconnection and interdependence of the power system, increased resilience and reliability impacts can be inferred to other sites and facilities. The Distribution System and its associated projects will impact the municipality of Cataño directly from 1801 Substation, which would be serving residential and industrial loads. Also, other municipalities outside Cataño benefit from the projects as distribution feeders serving loads in Guaynabo and Bayamón, Toa Baja, and San Juan, as depicted by the attached map for Distribution Feeders in **Figure 1**. The neighboring municipalities served out of Cataño 1801 also have direct bordering customers served from the other utility and privately owned generation systems and substations interconnected via the Transmission system.

For example, Bayamón TC (Transmission Center), directly interconnected with Cataño Substation 1801, has improved, and upgraded projects to support increased reliability and system stability for residential customers and their communities. These include facility upgrades and replacements to Transmission and Distribution Switchgear, and Transmission and Distribution Power Transformers, Transmission and Distribution Line protection upgrades. Such impacts and benefits are discussed in further detail below.

The Cataño Modernization and Hardening Project (Substation 1801) aims to update substation equipment to PREPA and industry standards, improve system resiliency, and mitigate safety hazards due to equipment age or environmental concerns. Impacts are addressed in the following sections and are documented in addition to rate affordability and service reliability.

Project Impact to Vulnerable Populations

¹⁸ Burkes, Cordare, Keister, and Cheung. (2017) *Solid State Power Substation Roadmap*, prepared for the Department of Energy.

Cataño Substation 1801 is part of the Power Grid and interconnected system with neighboring areas and municipalities in terms of both the Transmission and Distribution systems. In addition to **Cataño**, other municipalities serviced by repairs and improvements in this project include areas of **Bayamón, Toa Baja, San Juan, and Guaynabo**. However, because of the interconnectivity of the power grid, the impacted area for the project has been identified as a direct impact area as outlined in **Figure 1**.

In the development of electrical power systems improvement projects, LUMA projects are developed by an Asset Category (or several Asset Categories), in alignment with FEMA definitions and protocols. Each asset's functionality and interconnection with others constitute the Power System, making it essential to acknowledge. Equally important to note, is that these categories will have elements and components of other asset categories as part of the overall scope of work.

As discussed in Appendix H.0, social vulnerability indicators and population density identify the most vulnerable areas across Puerto Rico. However, they do not provide a complete representation of all protected classes on the Island. Protected classes' populations, such as racially and ethnically concentrated poverty areas, correlate with the total population across Puerto Rico's census tracts and are highly reliable in determining the locations and concentrations of these other protected class populations of concern.¹⁹ These correlations are discussed in further detail in Appendix H.0, with associated data, demonstrative maps, and charts using power outage just after Hurricane María (2017) to substantiate this assertion.

R/ECAPs Populations

One (1) of the proxies explored in this examination are HUD's geospatial representation of *Racially and Ethnically Concentrated Areas of Poverty (R/ECAPs)*²⁰ using population densities, and not percentages, to better characterize low-income and impoverished non-white communities more appropriate for Puerto Rico. HUD defines R/ECAP census tracts with populations of 50% or more of non-white persons and 40% or more of individuals living at or below the poverty line.²¹

Maps below were created to facilitate the discussion on the impacts on vulnerable populations within the area to be served by the project. These maps also illustrate how

¹⁹ CDBG-DR Electrical Systems Enhancements & Improvements Action Plan, Appendix H – Enhanced Analysis of Vulnerable Populations and Protected Classes is located at https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-for-the-electrical-systems-enhancements-effective-on-march-25-2022/?ind=1648753773525&filename=ADM_POLI_Report_Energy%20Action%20Plan_Appendix%20H.pdf&wpdmdl=25442&refresh=637292549f79f1668452948 (English) and https://cdbg-dr.pr.gov/download/plan-de-accion-cdbg-dr-para-la-optimizacion-de-la-red-electrica-efectivo-el-25-de-marzo-de-2022/?ind=1648753790173&filename=ADM_POLI_Report_Energy%20Action%20Plan_Appendix%20H_ES_.pdf&wpdmdl=25441&refresh=636cec7793dee1668082807 (Spanish).

²⁰ HUD, Office of Development and Research. *Racially or Ethnically Concentrated Areas of Poverty (R/ECAPs)*. Datasets accessed at: https://hudgis-hud.opendata.arcgis.com/datasets/56de4ede8264fe5a344da9811ef5d6e_0

²¹ William J. Wilson defines neighborhoods of extreme poverty as census tracts with forty percent (40%) or more of individuals living at or below the poverty line. More on R/ECAPs can be read in *Wilson's The Declining Significance of Race: Blacks and Changing American Institutions*, Chicago: University of Chicago Press.

vulnerable populations relate to the locations of the proposed Cataño project elements. Note in the legend, the first four (4) digits label the substation and the number after the dash identifies the feeder that interconnects in the substation; assuming, although it is difficult to see in the scale of the maps embedded in the text, these feeders have multiple segments in different directions along the way that connect to customers up to the end which therefore represent a full circuit. For reference, maps for both **Feeders** and **Distribution** lines within the project area are attached. Pockets of feeders in neighborhoods not served by the main Substation are not selected or identified here.

R/ECAP Tracts with Corresponding Distribution Substations & Feeders

In **Figure 1**, the R/ECAP census tracts are shaded in pink. As the map demonstrates, HUD -defined R/ECAP populations within the area of benefit of Substation 1801 are co-located with several clusters of feeders and substations proposed in this project. Consequently, the R/ECAP populations in the service area will directly benefit from repairs and improvements to the substation. In addition, other substations connected to them, ancillary equipment, and associated transmission lines will benefit, thereby improving both transmission and distribution of more reliable power to those who need this functional stability the most.

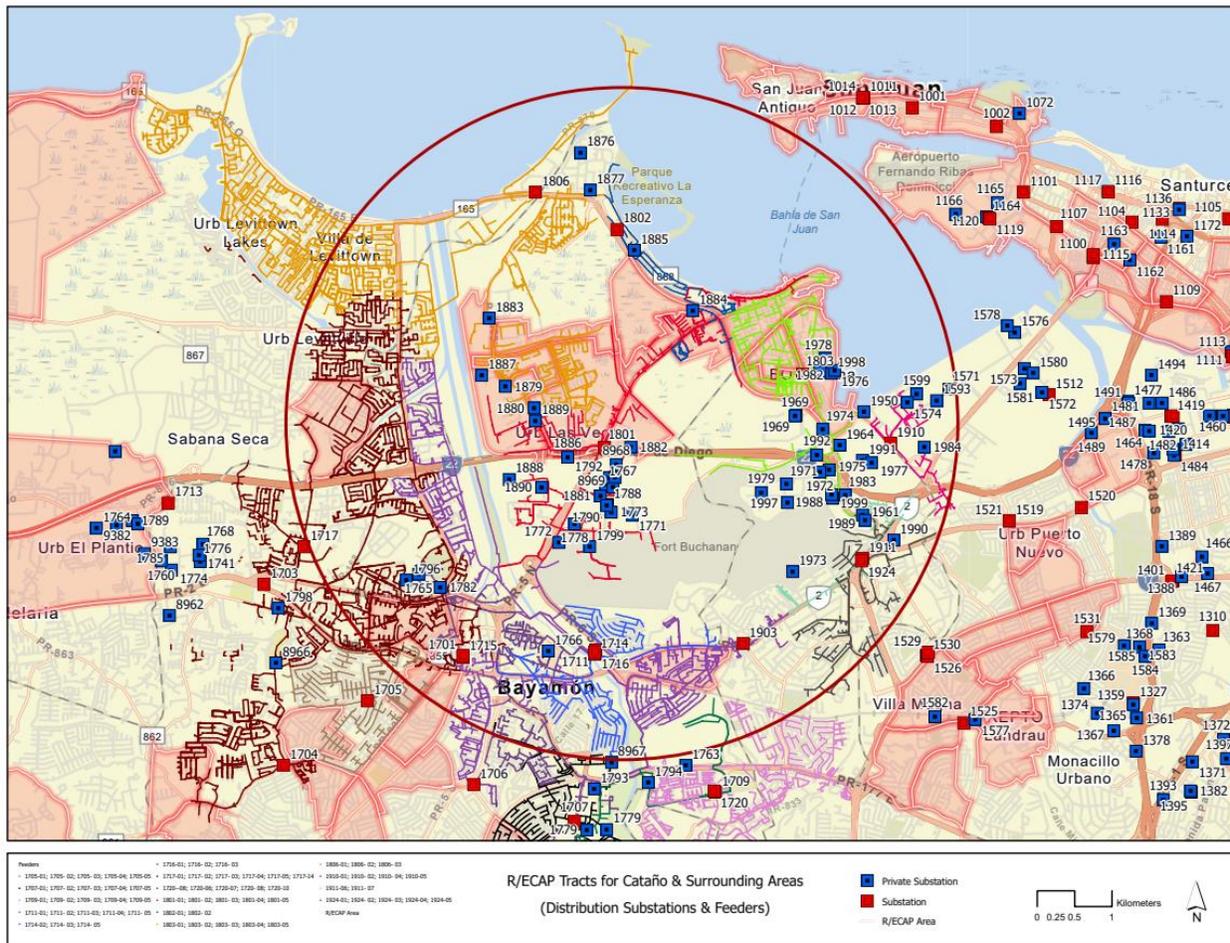


Figure 1 - R/ECAP Tracts with Corresponding Distribution Substations & Feeders

It is suggested, in Appendix H.0, that the inclusion of the Hispanic subpopulation within R/ECAPs better reflects Puerto Rico. A full assessment of these populations, realigned to better represent them across the Island with extensive power outages post María, can be found in Figure 20 A in **Appendix H.0** of the Action Plan.

Protected Classes

Protected classes within populations tend to overlap with other socially and economically vulnerable populations. The Fair Housing Act (42 U.S.C. § 3601 *et seq.*) prohibits housing discrimination based on race, color, national origin, religion, sex, familial status, or disability. The Fair Housing Act protects people from discrimination while renting or buying a home, obtaining a mortgage, seeking housing assistance, or engaging in other housing-related activities. Additional protections apply to certain CDBG funded activities, including consideration of racially and ethnically concentrated areas and concentrated low-income areas. Considering the locations of diverse racial and ethnic populations and others with pre-disaster social vulnerabilities that live in disaster-

impacted areas are useful for emergency response, recovery, and mitigation planning, policy, and programmatic development.

Although each of these characteristics is included in the social vulnerability assessments used in the Action Plan and needs assessments across proposed CDBG-DR projects on the Island, each of these indicators of social vulnerability has ties to adverse outcomes in relation to hazards. Appendix H.0 contains a more detailed assessment of vulnerable populations with descriptive maps and additional data tables for review.

A more nuanced analysis of Afro Caribbean ancestry, disability, poverty, and the intersection of race/ethnicity and poverty may provide helpful data in addition to those identified by social vulnerability measures or LMI (**Table 7 of the CDBG-DR Electrical Power Systems Enhancements and Improvements Action Plan**). Accordingly, **Figures 2** and **3**, **List 1**, and the discussion below provides more context for Protected Classes to benefit from the proposed project.

Protected Classes with Distribution Substations and Feeders: R/ECAPs and Disability²²

In **Figure 2**, R/ECAP census tracts within the area of benefit overlap with the distribution substations and feeders. An important distinction from **Figure 2** is the incorporation of percentage of the self-identified disabled population within these and other census tracts in the area of benefit, with shades of green depicting the percentages of the total population for those geographies.

²² Any difference in tract counts is due to the merging and splitting of census tracts per the latest ACS layers.

R/ECAP Tracts with Percent of Population with a Disability
 Cataño & Surrounding Areas - Distribution Substations & Feeders

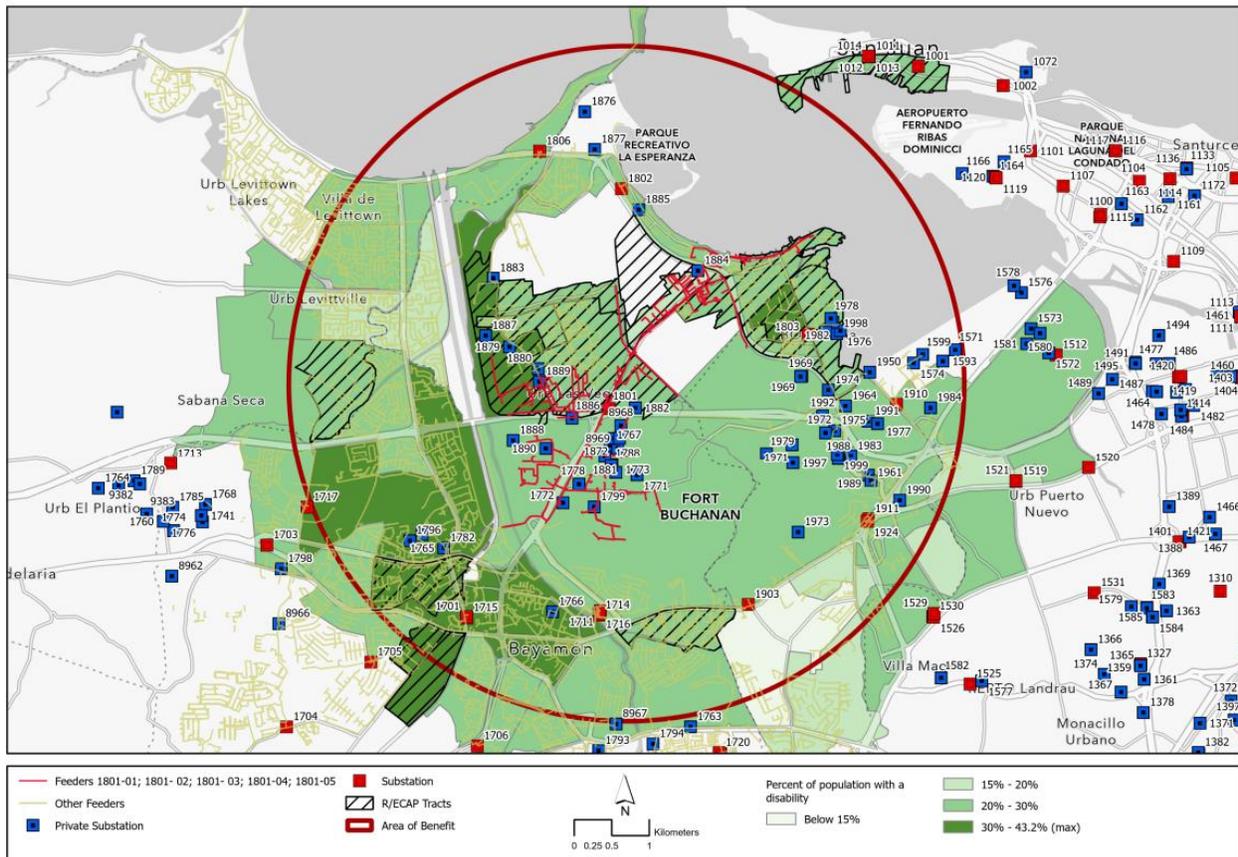


Figure 2 - Protected Classes with Distribution Substations and Feeders: R/ECAPs and Disability

Protected Classes with Distribution Substations and Feeders: R/ECAPs and Hispanic Afro Caribbean Population²³

In **Figure 3**, R/ECAP census tracts within the area of benefit also overlay with the distribution substations and feeders. An important distinction from the previous maps is the incorporation of percentage of the self-identified Hispanic Afro Caribbean population in these and other census tracts in the area of benefit, with a yellow-green-blue color ramp depicting the percentages in relation to total population for those geographies.

²³ Any difference in tract counts is due to the merging and splitting of census tracts per the latest ACS layers.

R/ECAP Tracts with Percent of Population that are Hispanic Afro Caribbean Ethnicity
 Cataño & Surrounding Areas - Distribution Substations & Feeders

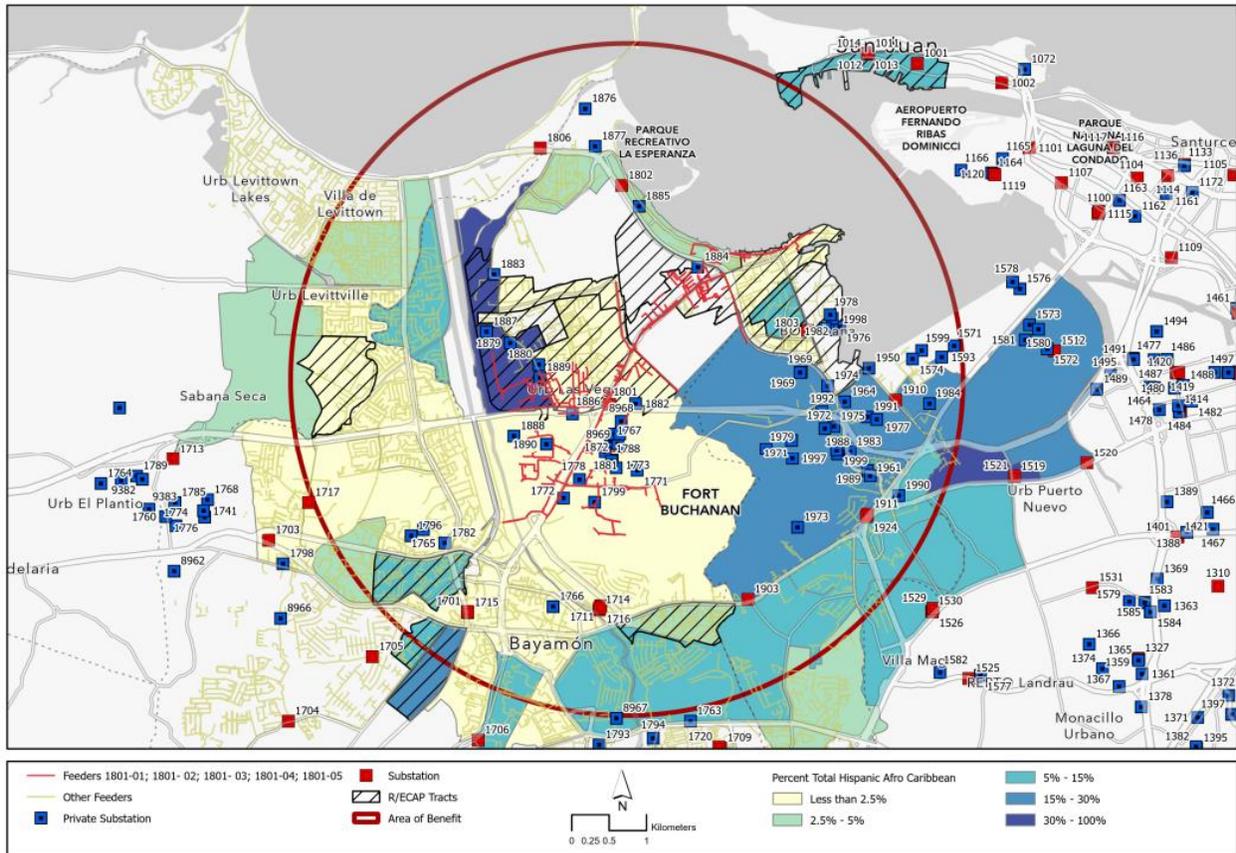


Figure 3 - Protected Classes with Distribution Substations and Feeders: R/ECAPs and Hispanic Afro Caribbean Population

Selected Protected Classes for Municipalities in Benefit Area²⁴

The proposed improvements directly impact the vulnerable populations represented in **Figure 3**. They are within the Area of Benefit (**AOB**) as shown within and intersecting the red circle above. To highlight protected classes to benefit from the project, **Table 7** contains population data of interest for this area of benefit, which is comprised of census tracts from five (5) Municipalities: Bayamón, Cataño, Guaynabo, San Juan, and Toa Baja. The Table focuses on the specific Census Tracts within the calculated LMI Area of Benefit, which are represented in the map as the tracts shaded with the yellow-blue ramp.²⁵ This Table, along with **Figure 3**, is intended to aid in a more nuanced analysis of Afro Caribbean ancestry, disability, poverty, and the intersection of race/ethnicity and poverty to provide context specific data in addition to those identified by social vulnerability measures or LMI.

²⁴ Any difference in tract counts is due to the merging and splitting of census tracts per the latest ACS layers; however, these differences do not influence total Municipality counts in this table.

²⁵ The LMI Area Benefit is determined and evaluated based on the direct impact area of the project (red circle).

AREA OF BENEFIT (AOB)

County / Municipio	Total AOB Population	AOB Population with a Disability	Population with a Disability %	AOB Hispanic Afro Caribbean Cuban and Dominican Population	Hispanic Afro Caribbean Cuban and Dominican %
Bayamón	51,156	13,716	26.81%	2,189	4.28%
Cataño	23,698	5,097	21.51%	566	2.39%
Guaynabo	23,716	4,806	20.26%	1,637	6.90%
San Juan	10,751	2,534	23.57%	1,602	14.90%
Toa Baja	21,266	4,792	22.53%	540	2.54%

Table 7 - Selected Protected Classes for Census Tracts by Municipio in Benefit Area

Sources: 2020 ACS Census Data

Disability

Identifying and incorporating consideration of mobility and other diverse abilities is important to disaster management and mitigation activities. It is also a core element of social vulnerability studies and is incorporated into such analyses.

Figure 2 highlights the intersectional nature of social and physical vulnerabilities, with the highest proportion of impoverished Hispanic (**R/ECAP**) portions of the population tending to more likely also identify as disabled within the area of benefit. This validates observations made in Appendix H.0, that Cataño and Bayamón, located in the area of benefit, are two (2) of nine (9) municipalities in Puerto Rico that have more than 20% of their respective populations categorized as disabled or with difficulties in at least one (1) of the six (6) categories accounted for by the U.S. Census.

When you consider the reach of the improvements, the line segments for feeders from substations to end customers represented in **Figure 1**, these populations will also benefit greatly from completion of the project. In addition to improved electric power infrastructure, increased reliability will be an important benefit to disabled populations. Such benefits include having a consistent source of power for medical devices or specific medications or reducing the need for increased mobility. A reduction to access to reliable power sources may limit the provision of required accommodations such as elevators or hard-wired warning systems in various structures that require a reliable power source. These improvements ultimately support access to more sustainable safe places to live.

Race, Ethnicity, and National Origin

All census tracts in Puerto Rico have a 75% or higher concentration of “Hispanic or Latino” defined as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race. Puerto Rico is 98.7% Hispanic/Latino population automatically qualifies most of Puerto Rico as a protected class according to the Fair Housing Act.²⁶

While there are regional patterns of higher percentages of non-white populations living in the southwestern and some northeastern parts of the Island, generally speaking, the vast majority of municipalities are comprised of those that identify as white. However, it must be noted that data on race) may be misleading in the Puerto Rican context due to historical trends in identifying as “white” even though much of the population across the Island has roots in Africa (see Appendix H.0 for more detailed analysis and references).

As with the disabled populations discussed in the previous subsection, once the reach of the improvements is considered, the line segments for feeders from substations to end customers represented in **Figures 1, 2, and 3**, these populations will also benefit greatly from completion of the project. Similarly, to the benefits described above, improvements to the power system for non-white Hispanic populations address needs for these vulnerable communities that otherwise systemically reduce their ability to respond to disasters. This includes reducing the need for financial and geographic mobility that ultimately disrupts the communities’ access to social, cultural, and place-based resources integral to the sustainability and resilience of these communities impacted by the loss of reliable power.

Increased Reliability or Lower Electricity Rates

There are also planned system and facility improvements at the San Juan Plant, which is directly tied to Cataño Substation 1801 and similar grid improvements at Palo Seco Generation Plant connected directly to Cataño. These systemwide projects and upgrades contribute to overall improvements in system reliability, performance, and resilience, which directly impact residential customers fed from the Cataño Substation and neighborhood areas mostly comprised of LMI, protected classes, and vulnerable populations. Because of the interconnection of the grid, a project that increase the reliability, performance, and reliability in one area will have a cascading impact increasing the reliability and resilience of the system as a whole. For example, the loss of a single large power plant due to a forced outage or storm can immediately reduce the total available generating capacity by roughly 10%. Such loss creates a cascading impact on the generation capacity and puts added demand on other generation facilities - often operating at maximum capacity. As a result, and because of the unreliable nature of Puerto Rico's generation facilities, the loss of a single large generator

²⁶ See Table 6 of the CDBG-DR Electrical Power Systems Enhancements and Improvements Action Plan.

would likely result in extended outages caused by insufficient generation supply to meet energy demand.²⁷

Transmission outages, fuel supply disruptions, and flooding, among other events, can all place significant stress on the ability of the system to serve load during or after a storm.²⁸ For example, a power system blackout caused by a storm may require the implementation of black start operations, which usually require the use of more expensive fossil fuels and can cause surcharges that are passed on to customers.²⁹

Therefore, increased reliability will not only reduce the need to use backup generators and costly re-starts to the power system, but will also prevent that the Puerto Rico population, which is mostly LMI, assume the increased cost of this type of emergency power generation.³⁰

Benefit to LMI Population

Beneficiaries of CDBG-DR funded projects must meet specific criteria for income and other population characteristics in accordance with HUD National Objectives. These are defined by both socioeconomic and spatial, service area data. PRDOH utilizes the following process for establishing and verifying whether a project that provides benefit to an area meets the LMI-Area Benefit National Objective:

- 1) Confirm the proposed activity can be used by, and is accessible to, all persons within an area.
- 2) Determine the boundaries of the entire area served by a project activity.
- 3) Confirm the service area as primarily residential.
- 4) Use the appropriate Adjusted LMI table(s) to calculate the Total and LMI Beneficiaries within the service area. If applicable, income survey data could be used.

²⁷ See Motion to Submit LUMA's Resource Adequacy Study, Generation Resource Adequacy Analysis, page 10, at <https://energia.pr.gov/wp-content/uploads/sites/7/2022/09/Motion-to-Submit-Lumas-Resource-Adequacy-Study-NEPR-MI-2022-0002.pdf>.

²⁸ See Motion to Submit Feasibility Study and July 2022 Status Report, *New Palo Seco Combined Cycle Power Generation Scoping & Feasibility Report*, page 50, at <https://energia.pr.gov/wp-content/uploads/sites/7/2022/07/20220715-Motion-to-Submit-Feasibility-Study-and-July-2022-Status-Report.pdf>

²⁹ See Luma Press Release, LUMA Files Quarterly Fuel Cost Adjustment Impacted by Global Energy Events/Crisis; Calculation Based on Fuel Cost Information Provided by PREPA, at <https://lumapr.com/news/luma-files-quarterly-fuel-cost-adjustment-impacted-by-global-energy-events-crisis-calculation-based-on-fuel-cost-information-provided-by-prepa/?lang=en>.

³⁰ Reliability analyses may demonstrate if a utility is prepared for disruptions under normal operating conditions and contingency events See, *New Palo Seco Combined Cycle Power Generation Scoping & Feasibility Report*, page 50, at <https://energia.pr.gov/wp-content/uploads/sites/7/2022/07/20220715-Motion-to-Submit-Feasibility-Study-and-July-2022-Status-Report.pdf>.

5) Confirm the ratio of LMI to Total Beneficiaries is greater than or equal to 51% and other National Objective criteria listed above.

6) Use Census Summary File Data Table DP05³¹ and income survey data to determine the Race, Ethnicity, Gender, Head of Household type, and the Total beneficiaries within the proposed service area.³²

Determine LMI Methodology

The following methodology is used to determine the LMI for the Area of Benefit identified for this project. This methodology will be applied to proposed projects to ensure project eligibility and appropriateness for the ER1 Program:

1. Select all census tracts which intersect the **Area of Benefit**.
2. Generate a table comprised of each **Census Tracts** intersected with the Area of Benefit, Total Persons, Total LMI Persons, and LMI Percentage fields.
3. Combine all Tracts and calculate the composite **LMI Percentage for the Area of Benefit** totals: (Total LMI Persons) Sum/(Total Persons) Sum.

The Project **Area of Benefit** for this proposed project is therefore determined by using census tracts aligned with a service area buffer to benefit from the project improvements. The resulting Area of Benefit is represented in the attached map. For the Cataño Substation 1801 project, the Area of Benefit, as determined by alignment within the service area provided by the utility, includes Census Tracts in Cataño, Bayamón, Toa Baja, San Juan, and Guaynabo, and is represented in **Figure 4. Cataño Station Project Area of Benefit and Corresponding Census Tracts**. Given the interconnectedness and interdependence of the grid and its components as a network, this is the most appropriate method for drawing the Area of Benefit.

Cataño Substation Project Area of Benefit and Corresponding Census Tracts

The next step is to gather the appropriate census data to calculate LMI for the project. For this project, we will use **Census Tracts** given they are the most appropriate geography for a project of this scale (across municipalities). Once these are identified, the following data will be needed: Total Persons, Total LMI Persons, and LMI Percentage. In **Figure 4**, forty-six (46) out of sixty-two (62) Census Tracts across five (5) *Municipalities*: Cataño, Bayamón, Toa Baja, San Juan, and Guaynabo are within the direct impact area. Based on the information for these Census Tracts, we also know that even though there are industrial and business land uses within the Area of Benefit, the area served is primarily **residential**.

³¹ See U.S. Census Bureau at https://data.census.gov/cedsci/profile/Puerto_Rico?q=0400000US72

³² This process established by PRDOH may be subject to amendments.

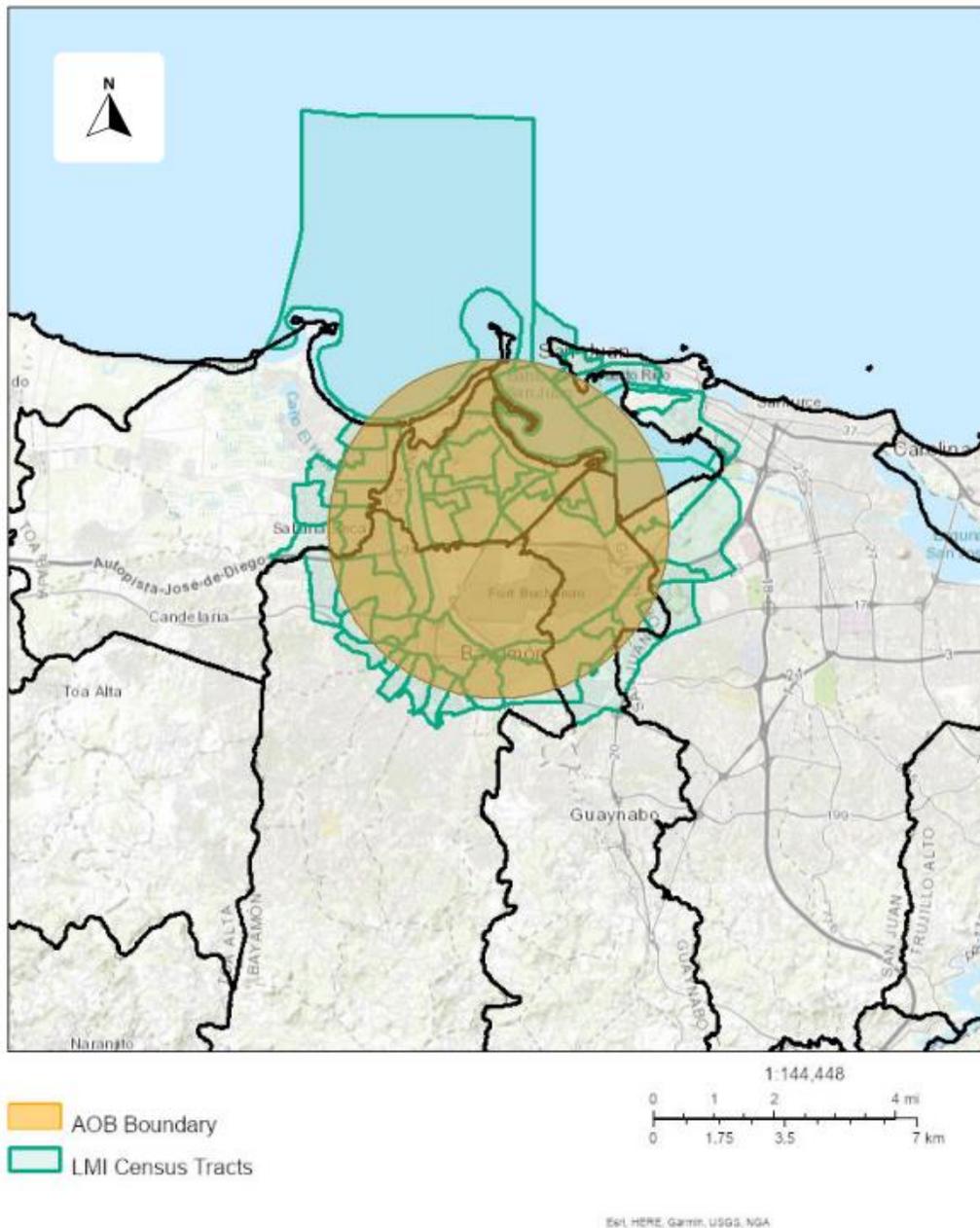


Figure 4 - Cataño Substation Project Area of Benefit and Corresponding Census Tracts

The adjusted LMI and population data for each tract are compiled in a table in the LMI Report prepared for the Cataño Substation project. The same LMI Report will be generated for each project selected. The **Overall LMI Area of Benefit** for the Cataño Substation project is 67% for a total of 89,778 LMI persons out of 133,785 Total Persons.

LMI Calculation for Cataño Substation Project³³

Total Persons	Total LMI Persons	Area of Benefit LMI Percentage
133,785	89,778	67%

Table 8 - LMI Calculation for Cataño Substation Project

Once the LMI is confirmed to meet the minimum LMI requirements, the subrecipient and LUMA will coordinate the compilation and submission of pre-project and post-completion data for **grid reliability and/or affordability**. Specifically, LUMA may provide appropriate complete and aggregate data on pay rates for the grant period through the completion of the performance metrics as determined in the Subrecipient Agreement with PRDOH. Or it may provide system-wide and/or substation-specific service disruption counts, duration, and context before the start of the grant period through completion of performance metrics as determined in the Subrecipient Agreement with PRDOH.

Eligibility determination via the methodology described above will occur prior to project award, be monitored throughout the contract, and be confirmed as a part of project closeout. As of the creation of this document, the proposed project scope and area of benefit meet the National Objective LMI requirement.

Impacts for LMI Populations

Residents, including LMI populations, served by the improved electric power infrastructure will benefit from increased power infrastructure reliability. The project will also substantially reduce the frequency of power service disruptions and improve systemic resilience over the lifespan of the improvements. Given lower income communities limitations to respond to disasters, such as the ability to purchase expensive home generators or the flexibility to evacuate or move, the reliability of electric power infrastructure is crucial for having safe places to live. Furthermore, LMI populations would benefit from lower rates with a system built to ultimately survive future disasters with minimal, more equitable and less expensive recovery once these projects are fully executed.

Critical lifeline improvements to the grid will increase reliability and fortification and provide groundwork to enable the future development of smart, redundant, secure, and efficient electrical systems, along with promoting the development of diverse generation and associated transmission systems. These multi-scale impacts have the potential to span both micro and macro grid/area and neighborhood scaled projects. Ultimately, the ER1 Program critical lifeline improvements will bridge the gap between the vulnerable populations and solutions that foster resilience and stability amongst these communities.

³³ Any difference in tract counts is due to the merging and splitting of census tracts per the latest ACS layers; however, these differences do not influence total *municipality* counts or calculations represented in this table.

As demonstrated by the Cataño Substation Project, Electrical Projects on the list of potential projects will be selected based on the direct and indirect benefit to LMI communities and vulnerable populations as they become available for ERI funding and are approved by FEMA and PREB. Electrical infrastructure improvements and upgrades, including interconnected Transmission Lines, Distribution Lines, Generation, Enabling Technologies, and Substations, will affect both the direct service area of the projects and indirectly impacted neighboring municipalities. Overall system health, reliability and resilience will measurably improve across the mostly LMI Island. Utility performance metrics and tools, such as SAIDI, SAIFI, and CAIDI, will enable effective tracking of performance progress and completion.

D. List of Possible Eligible Projects under ER1 Program as of August 10, 2022.³⁴

Initial SOW	FEMA FAAS ^t No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution – Vieques Feeders 2501-01, 2501-02, 2501-03 and Culebra Feeders 3801-01, 3801-02	165226	28.80	April 28, 2021	June 8, 2021		Distribution	Distribution Line Rebuild	
Rio Grande Estates - CH - 2306	165268	3.70	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations - Tapia GIS Rebuilt - Equipment Repair & Replacement	169495	23.00	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations - Cataño – Rebuilt 1801	174422	11.30	April 28, 2021	June 8, 2021	May 17, 2022	Substations	Substation Rebuilds	
Buildings - Aguadilla Electric Service Center	169804	3.50	April 28, 2021	June 8, 2021		Buildings	Facilities Development & Implementation	
Buildings - Arecibo Electric Service Center	169798	2.32	April 28, 2021	June 8, 2021		Buildings	Facilities Development & Implementation	
Buildings - Arecibo Regional Office Building	169576	1.80	April 28, 2021	June 8, 2021		Buildings	Facilities Development & Implementation	
Substations – Bayamón TC – MC-BKRS-Y1	169500	5.70	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Transmission Access Roads	165208	15.19	April 28, 2021	June 8, 2021		Environmental	To be allocated to appropriate program	
FAAS ^t - Line 36100 - Dos Bocas HP to Monacillos TC (Transmission)	167446	115.49	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	

³⁴ See, NEPR-MI-2021-0002, In Re: Review of the Puerto Rico Electric Power Authority's 10 Year Infrastructure Plan https://energia.pr.gov/wp-content/uploads/sites/7/2022/08/Exhibit2_2022-08-10_Project-Listing.xlsx.

Initial SOW	FEMA FAASt No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
FAASt - Line 36200 - Monacillos TC to Juncos TC (Transmission)	167443	42.73	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Transmission Line 51300 - Ponce TC to Costa Sur SP TC	166707	26.08	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Aguas Buenas TC to Caguas TC - 39000 (Transmission)	177191	9.70	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Canóvanas TC to Sabana Llana TC - 36800 (Transmission) FAASt Canóvanas TC to Palmer-Fajardo TC - 36800 (Transmission)	180326	70.31	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Garzas 1 HP to Garzas 2 HP - Line 1100 (Transmission)	176954	3.58	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Guaraguao TC to Comerio TCLine-4100 (Transmission)	177134	25.28	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Palo Seco SP to Cataño SectLine-9500 (Transmission)	176913	6.71	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAASt Ponce TC to Jobos TC - 100 (Transmission) FASSt Ponce TC to Jobos TC - 200 (Transmission)	180052	156.55	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	

Initial SOW	FEMA FAAsT No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
FAAsT San Juan SP to Cataño SectLine-8200 (Transmission)	176971	8.07	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAAsT Transmission - Line 50100 - Cambalache GP TC to Manafí TC (Transmission)	167508	43.47	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAAsT Transmission - Line 37800 - Jobos TC to Cayey TC Transmission - Line 37800 - Cayey TC to Caguas TC (Transmission)	166860	52.00	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAAsT Transmission Line 37800 Caguas TC to Monacillos TC (TRANSMISSION)	166904	33.40	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
FAAsT_TRANSMISSION-LINE-37100_COSTA SUR-ST_ACACIAS-TC	167168	91.99	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
Transmission - Line 36400 - Dos Bocas HP to Ponce TC	168483	87.44	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
Transmission - San Juan 115-kV Underground Transmission Loop	168226	10.00	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	
Transmission – Line 5400 – Rio Blanco HP to Daguao TC to Punta	165213	73.06	April 28, 2021	June 8, 2021		Transmission	Transmission Line Rebuild	

Initial SOW	FEMA FAAsT No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Lima TO to Vieques 2501 to Culebra 3801								
Culebra SUB 3801	165209	1.20	April 28, 2021	June 8, 2021	June 9, 2022	Substations	Substation Rebuilds	
FAAsT Caridad – XFMR MC 1714 (Substation)		5.50	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
FAAsT Manafí TC - BRKS 230 kv (Substation)	179558	1.80	April 28, 2021	June 8, 2021	May 25, 2022	Substations	Substation Rebuilds	
FAAsT Viaducto TC - MC 1100 - Equipment Repair & Replacement (Substations)	169276	4.00	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations – Aguirre TC - BRKS	178503	12.20	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations - Llorens Torres MC 1106 - Equipment Repair & Replacement	169058	4.00	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations – Cachete – MC 1526	178577	4.00	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations - Centro Médico 1327/1359 Equipment Repair & Replacement	169266	11.70	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations – Costa Sur SP TC – Equipment Repair and Replacement	169896	3.60	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	
Substations – Taft – MC 1105	178258	4.10	April 28, 2021	June 8, 2021		Substations	Substation Rebuilds	

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Vieques SUB 2501	165225	2.30	April 28, 2021	June 8, 2021	June 9, 2022	Substations	Substation Rebuilds	
Distribution Feeders - Arecibo Short Term Group 1	436616	53.58	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Bayamon Short Term Group 1	334473	85.00	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Bayamon Short Term Group 2	334474	10.35	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Bayamon Short Term Group 3	334475	65.68	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 1	334420	59.85	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 2	334443	111.96	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 3	334452	82.07	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 4	334488	44.71	July 8, 2021	August 20, 2021	May 25, 2022	Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 5	334491	72.35	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	

Initial SOW	FEMA FAAS# No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution Feeders - Caguas Short Term Group 6	334497	72.65	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 7	334518	49.18	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Caguas Short Term Group 8	334527	23.65	July 8, 2021	August 20, 2021	June 9, 2022	Distribution	Distribution Line Rebuild	
Distribution Feeders - Carolina Short Term Group 2	334476	40.50	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Carolina Short Term Group 3	334477	60.76	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Mayaguez Short Term Group 1	334308	74.17	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Mayaguez Short Term Group 2	334285	108.85	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Mayaguez Short Term Group 3	334191	134.67	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Mayaguez Short Term Group 4	334293	98.50	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - Ponce Short Term Group 1	334323	40.60	July 8, 2021	August 20, 2021	May 25, 2022	Distribution	Distribution Line Rebuild	

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution Feeders - Ponce Short Term Group 2	334329	42.38	July 8, 2021	August 20, 2021	May 19, 2022	Distribution	Distribution Line Rebuild	
Distribution Feeders - San Juan Short Term Group 1	334471	40.69	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Distribution Feeders - San Juan Short Term Group 2	334472	10.56	July 8, 2021	August 20, 2021		Distribution	Distribution Line Rebuild	
Line 1900 Dos Bocas HP to San Sebastian TC	334331	51.20	July 8, 2021	August 20, 2021		Transmission	Transmission Line Rebuild	
Line 2200 Dos Bocas HP to Dorado TC	334468	103.80	July 8, 2021	August 20, 2021	July 11, 2022	Transmission	Transmission Line Rebuild	
Line 3000 Monacillos TC to Juncos TC	334482	90.44	July 8, 2021	August 20, 2021		Transmission	Transmission Line Rebuild	
Line 3100 Monacillos TC to Daguao TC	334470	113.33	July 8, 2021	August 20, 2021		Transmission	Transmission Line Rebuild	
Line 500 Ponce TC to Costa Sur SP	334334	36.59	July 8, 2021	August 20, 2021		Transmission	Transmission Line Rebuild	
Line 8900 Monacillos TC to Adm. Tribunal Apelaciones	334469	11.51	July 8, 2021	August 20, 2021		Transmission	Transmission Line Rebuild	
115 kV Transmission Priority Poles and Structures Replacements		318.80	August 30, 2021	September 22, 2021		Transmission	Transmission Priority Pole Replacements	
230 kV Transmission Priority Poles and Structures Replacements	668669	31.30	August 30, 2021	September 22, 2021		Transmission	Transmission Priority Pole Replacements	

Initial SOW	FEMA FAAS ^t No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
38 kV Transmission Priority Poles and Structures Replacements →	668583	378.80	August 30, 2021	September 22, 2021		Transmission	Transmission Priority Pole Replacements	
38 kV Transmission Priority Poles and Structures Replacements →	668592							
Distribution Feeders - Arecibo Short Term Group 2	542762	73.91	August 30, 2021	September 22, 2021	June 2, 2022	Distribution	Distribution Line Rebuild	
Distribution Feeders - San Juan Short Term Group 3	546374	27.28	August 30, 2021	September 22, 2021		Distribution	Distribution Line Rebuild	
Distribution Pole & Conductor Replacement → FAAS ^t [Distribution Pole and Conductor Repair - San Juan Group 2] (Distribution)	673838	600.00	August 30, 2021	September 22, 2021	July 11, 2022	Distribution	Distribution Pole and Conductor Repair	
Distribution Pole & Conductor Replacement → FAAS ^t [Distribution Pole and Conductor Repair - Bayamón Group 2] (Distribution)	673839				July 11, 2022			
Distribution Pole & Conductor	673848				July 11, 2022			

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Replacement → FAAS ^t [Distribution Pole and Conductor Repair- Carolina Group 3] (Distribution)								
Distribution Pole & Conductor Replacement →	673771							
Distribution Pole & Conductor Replacement →	673772							
Distribution Pole & Conductor Replacement →	673774							
Distribution Pole & Conductor Replacement →	673775							
Distribution Pole & Conductor Replacement →	673795							
Distribution Pole & Conductor Replacement →	673818							
Distribution Pole & Conductor Replacement →	673836							
Distribution Pole & Conductor Replacement →	673843							

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution Pole & Conductor Replacement →	673844							
Distribution Pole & Conductor Replacement →	673847							
Distribution Pole & Conductor Replacement →	674072							
Distribution Pole & Conductor Replacement →	674083							
Distribution Pole & Conductor Replacement →	674088							
Distribution Pole & Conductor Replacement →	674092							
Distribution Pole & Conductor Replacement →	674096							
Distribution Pole & Conductor Replacement →	674098							
Distribution Pole & Conductor Replacement →	678985							
Distribution Pole & Conductor Replacement →	678988							

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution Pole & Conductor Replacement →	679127							
Distribution Pole & Conductor Replacement →	679133							
Distribution Pole & Conductor Replacement →	679134							
Distribution Pole & Conductor Replacement →	679149							
Distribution Pole & Conductor Replacement →	679153							
Distribution Pole & Conductor Replacement →	679457							
Distribution Pole & Conductor Replacement →	679458							
Distribution Pole & Conductor Replacement →	679025							
Distribution Pole & Conductor Replacement →	679026							
Distribution Pole & Conductor Replacement →	679033							

Initial SOW	FEMA FAAS ^t No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution Streetlighting → FAAS ^t - Aguada Streetlighting (Distribution)	542688	1220.00	August 30, 2021	September 22, 2021	April 27, 2022	Distribution	Distribution Streetlighting	
Distribution Streetlighting → FAAS ^t - Maunabo Streetlighting (Distribution)	542690				May 4, 2022			
Distribution Streetlighting → FAAS ^t [Streetlighting - Guánica] (Distribution)	542756				May 25, 2022			
Distribution Streetlighting → FAAS ^t - Luquillo Distribution Streetlighting (Distribution)	542517				May 19, 2022			
Distribution Streetlighting → FAAS ^t - Lajas Streetlighting (Distribution)	542687				May 19, 2022			
Distribution Streetlighting →	659623							
Distribution Streetlighting →	659625							
Distribution Streetlighting →	659715							
Distribution Streetlighting →	659968							

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Distribution Streetlighting →	660227							
Distribution Streetlighting →	660239							
Distribution Streetlighting →	660437							
Distribution Streetlighting →	666894							
Distribution Streetlighting →	671396							
Distribution Streetlighting →	671400							
Distribution Streetlighting →	671502							
Distribution Streetlighting →	673504							
Distribution Streetlighting →	678789							
Distribution Streetlighting →	678793							
Distribution Streetlighting →	678794							
Distribution Streetlighting →	678795							
Distribution Streetlighting →	679039							
Distribution Streetlighting →								
El Yunque 2305-01 Supply	546386	14.60	August 30, 2021	September 22, 2021		Distribution	Distribution Line Rebuild	

Initial SOW	FEMA FAAsT No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Energy Management System (EMS)	657300	42.00	August 30, 2021	September 22, 2021		IT and Telecommunications	Critical Energy Management System Upgrades	
Fiber Optic Replacement		229.50	August 30, 2021	September 22, 2021		IT and Telecommunications	IT OT Telecom Systems & Network	
Line 13300 Bayamón TC to Plaza del Sol	547350	5.39	August 30, 2021	September 22, 2021		Transmission	Transmission Line Rebuild	
Line 2700 Victoria TC to Quebradillas Sect.	547259	41.27	August 30, 2021	September 22, 2021		Transmission	Transmission Line Rebuild	
Line 2800 Aguadilla Hospital Distrito Sect to T-Bone TO	547269	3.14	August 30, 2021	September 22, 2021		Transmission	Transmission Line Rebuild	
Line 3600 Monacillos TC to Martin Peña TC	547221	39.98	August 30, 2021	September 22, 2021		Transmission	Transmission Line Rebuild	
Microwave Point-to-Point	662238	17.50	August 30, 2021	September 22, 2021		IT and Telecommunications	IT OT Telecom Systems & Network	
Primary and Secondary Control Centers		84.00	August 30, 2021	September 22, 2021		IT and Telecommunications	Control Center Construction & Refurbishment	
SCADA Remote Access and RTU Replacements →	551925	30.00	August 30, 2021	September 22, 2021		IT and Telecommunications	IT OT Telecom Systems & Network	
SCADA Remote Access and RTU Replacements →	551926							
SCADA Remote Access and RTU Replacements →	551927							
SCADA Remote Access and RTU Replacements →								

Initial SOW		FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Substation Repairs →	Minor	542758	400.00	August 30, 2021	September 22, 2021		Substations	Substation Rebuilds	
Substation Repairs →	Minor	546370							
Substation Repairs →	Minor	546371							
Substation Repairs →	Minor	549715							
Substation Repairs →	Minor	549725							
Telecom Infrastructure →		673292	96.50	August 30, 2021	September 22, 2021		IT and Telecommunications	IT OT Telecom Systems & Network	
Telecom Infrastructure →		678800							
Telecom Infrastructure →		679035							
Transport Network		551963	185.00	August 30, 2021	September 22, 2021		IT and Telecommunications	IT OT Telecom Systems & Network	
Two Way Land Mobile Radio Network		675406	46.20	August 30, 2021	September 22, 2021		IT and Telecommunications	IT OT Telecom Systems & Network	
Arecibo Region Repairs		548393	9.23	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
Bayamón Region Repairs	Region	551242	15.45	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
Caguas Region Repairs		550060	14.47	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
Mayagüez Region Repairs	Region	548440	13.35	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
Palo Seco South Building Repairs	South	551247	11.17	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Ponce Region Repairs	550500	20.29	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
San Germán Electrical Service Center	548596	2.48	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
San Juan Region Repairs	551827	31.03	August 30, 2021	October 14, 2021		Buildings	Facilities Development & Implementation	
Acacias 6801 TC Relocation	547344	29.10	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Arecibo Pueblo 8002 Relocation	547187	17.10	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Baldrich - 1422	550894	10.50	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Bayview Sectionalizer 1802 Relocation	551100	16.70	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Berwind TC - 1336	550162	13.40	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Caguas TC	550771	2.50	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Cambalache TC Relocation	547247	30.70	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Canas TC	547248	1.70	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Caparra 1911 & 1924	551914	6.60	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Charco Hondo 8008 Relocation	547273	16.30	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Condado - 1133	550986	10.60	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Conquistador - CH	550106	5.10	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Crematorio - 1512	551918	10.60	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Dorado TC Relocation	551916	40.10	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Egozcue - 1109	547243	10.50	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Esc. Industrial M. Such - 1423	550099	10.60	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Fonalledas GIS Rebuilt 1401 1421	550972	31.40	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Guaynabo Pueblo Substation	551260	17.20	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Line 11100 Canóvanas Sect. to GOAB 11115	551067	3.79	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 11400 Barceloneta TC to Florida TO	547226	13.81	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 1200 Mayagüez GP to Yauco 2 HP	547160	55.37	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 1500 Mayagüez GP to GOAB 1515	547342	58.61	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 2400 Dos Bocas HP to America Apparel	547251	21.47	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 36200 Fajardo to Río Blanco	548598	44.31	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 4000 Comerío HP to Escuela Francisco Morales	550070	22.33	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 600 Caguas TC to Gautier Benítez Sect.	550019	10.11	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Line 6700 Martín Peña TC to Villamar Sect.	550896	6.01	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 9100 Guaraguao TC to Bayamón Pueblo Sect.	551911	5.05	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Line 9700 Palo Seco SP to Bay View Sect.	550902	2.32	October 4, 2021	October 18, 2021		Transmission	Transmission Line Rebuild	
Monacillo TC	550950	1.00	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Pampanos Relocation	550498	16.30	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Parques y Recreos - 1002	550980	7.70	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Physical Security →	549764	53.80	October 4, 2021	October 18, 2021		Substations	Substation Security	
Physical Security →	549768							
Physical Security →	550910							
Physical Security →	551861							
Physical Security →	660422							
Puerto Nuevo - 1520	551912	10.60	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
San Jose Relocation	547271	17.00	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Santurce Planta (Sect) 1116	550998	9.90	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Tallaboa 5402	547241	6.90	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	
Victoria TC 7008	547343	5.50	October 4, 2021	October 18, 2021		Substations	Substation Rebuilds	

Initial SOW	FEMA FAAST No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Cybersecurity Implementation Program	668665	24.50	January 24, 2022	March 15, 2022		IT and Telecommunications	IT OT Cybersecurity Program	
Field Area Network (FAN)	674506	330.00	January 24, 2022	March 15, 2022		IT and Telecommunications	IT OT Telecom Systems & Network	
Isla Grande 1101	673920	0.60	January 24, 2022	March 15, 2022		Substations	Substation Rebuilds	
Test and Technology Laboratory	679006	11.90	May 20, 2022	July 11, 2022		Buildings	Technical Training, Test Lab and Historian	
Substation High Voltage Equipment Replacement		75.70	July 29, 2022	Pending PREB Approval		Substations	Substation Rebuilds	
Transmission and Distribution Automation Program Installation of Reclosers, Single Phase Reclosers and Fault Current Indicators		230.37	July 29, 2022	Pending PREB Approval		Distribution	Distribution Automation	
Costa Sur TC - Phase II		101.11	July 29, 2022	Pending PREB Approval		Substations	Substation Rebuilds	
Bayamon TC - Phase II		71.00	July 29, 2022	Pending PREB Approval		Substations	Substation Rebuilds	
IT OT Technology Systems Repairs	675345	35.70	August 10, 2022	Pending PREB Approval		IT and Telecommunications	IT OT Telecom Systems & Network	
Aguirre TC - Phase II		40.99	August 10, 2022	Pending PREB Approval		Substations	Substation Rebuilds	

Initial SOW	FEMA FAAS ^t No.	Initial SOW Estimate (\$MM)	Initial SOW PREB Submission Date	Initial SOW PREB Approval Date	FEMA Funding Obligation Receipt Date	FEMA Asset Category	LUMA Improvement	Program Name
Multiple → [Equipment and Materials] FAAS ^t and					June 9, 2022	Multiple	Multiple	