



PREB's Approved IRP



February 8, 2021
Puerto Rico Energy Bureau



IRP Evaluation and Approval Statutory Requirements



Statutory Requirements

Act 82-2010, known as the *Puerto Rico Energy Diversification Policy through Sustainable and Alternative Renewable Energy Act*.

- Established the first renewable energy portfolio standard (RPS) in Puerto Rico and required that a retail energy provider procure the following percent of its power needs through renewable energy:
 - 12% by 2015
 - 15% by 2020
 - 20% by 2035



Statutory Requirements

Act 83-2010, known as the Puerto Rico Green Energy Incentives Act, as amended.

- Established to among other things:
 - achieve the diversification of energy sources;
 - reduce the dependency on fossil fuels;
 - reduce and stabilize energy costs;
 - reduce the flight of capital caused by the import of fossil fuels; and
 - preserve and improve the environment.



Statutory Requirements

Act 57-2014, known as *The Puerto Rico Energy Transformation and RELIEF Act, as amended.*

- Provided governance of PREPA through the creation of an independent regulatory body, the Energy Bureau;
- Requires PREPA to submit, and the Energy Bureau to approve, an Integrated Resource Plan (IRP);
- A plan that considers all reasonable resources to satisfy the demand for electric power services during a period of twenty (20) years.



Statutory Requirements

Act 17-2019, known as the *Puerto Rico Energy Public Policy Act*

- Built upon the foundation created for integrated resource planning in Act 57 and sharpened the focus on:
 - accelerated renewable energy provision, Amended RPS
 - 20% by 2022
 - 40% by 2025
 - 60% by 2040
 - 100% by 2050
 - energy conservation and efficiency (EE)
 - demand response (DR)
 - distributed generation (DG)



IRP Approval Proceeding Summary



Summary of PREPA's IRP (2018-20) Proceeding and Approval



February 13, 2019, PREPA filed its IRP along with supporting workpapers and other documentation in this proceeding.



March 14, 2019, the Energy Bureau issued a Resolution and Order in which it determined that the IRP filing was incomplete.



June 7, 2019, PREPA filed the Revised IRP (Proposed IRP).



July 3, 2019, the Energy Bureau issued an Order setting forth the procedural schedule in accordance the Regulation 9021.



Summary of PREPA's IRP (2018-20) Proceeding and Approval



August 24, 2020, the Energy Bureau issued the Final Resolution and Order, to APPROVE IN PART AND REJECT IN PART the Proposed IRP. The Energy Bureau FURTHER MODIFIED the Action Plan in the Proposed IRP submitted by PREPA and ORDERED the adoption and implementation of the Modified Action Plan.



October 4, 2020, PREPA filed its Opposition to Request for Reconsideration of Certain Determinations made in the Final IRP Resolution.



December 2, 2020, the Energy Bureau issued a Final Resolution on Reconsideration.



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Solar PV	PREPA issue request for proposals (RFPs) or other similar structures for solar PV in blocks of approximately 250 MW, with goal of adding 1,380 MW over the first four years of the plan.	Modified	RFP structure to procure contracts for installation to reach at least 3,500 MW new Solar by 2025. The RFP for these resources must be open to all forms of renewable energy, including, but not limited to wind, hydro, solar PV, VPPs, and storage.



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Battery Energy Storage	Install 920 MW of Battery Energy Storage in the first Four years of the plan.	Modified	RFP structure to procure contracts for battery installation to reach at least 1,360 MW by 2025, and possibly higher levels if economic and available.
New Gas Turbines (Peakers)	Retire 18 Frame 5 GT's (21 MW each) and install 18 GT's (23 MW each) at selected locations across the island.	Rejected	Retirement of all eighteen (18) of the existing gas turbine peaking units and replacement of a small portion with a new set of GTs (up to 81 MW).



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Accelerated Energy Efficiency (EE) and Demand Response (DR)	Establish EE and DR programs with the objective of reducing the demand in values approximating the 2% per year.	Modified	Support all necessary steps to establish EE programs at 2% per year savings, including quick-start programs. Implement DR Guidelines; when issued, seek DR capacity from Commercial & Industrial customers and aggregators initially, followed by residential.



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Generating Units Retirement	Most of the existing generating fleet is recommended to be retired by 2025, Frame 5 peakers, Aguirre Steam 1 & 2, Costa Sur 5 & 6, San Juan 7 & 8. These retirements can only be carried out when all the conditions leading to the recommendation are in place.	Accepted with conditions	A portion of Frame 5 peakers, Aguirre Steam 1 & 2, San Juan Steam 7 & 8, Palo Seco Steam 3 & 4, Aguirre CC 1 & 2, Costa Sur 5 & 6. No undue delays in retirement, all MATS-impacted unit retirements expected during term of Modified Action Plan. In first five years of plan, subject to availability of new generation resources.



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Convert Retired Plants to Synchronous Condensers	8 units across San Juan, Palo Seco, Aguirre locations, over full planning horizon, for eventual conversion to synchronous condensers as necessary.	Accepted	N/A
New CCGT at Palo Seco	Install a small unit of about 302 MW by 2025, to limit the size of the largest unit in the system.	Does Not Approve the development of new unit, as part of least cost plan.	Preliminary work approved for limited siting, permitting and feasibility analysis, up to \$5 million. Must not interfere or delay renewable energy or BESS procurement process.



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
EcoEléctrica contract	EcoEléctrica contract renegotiation and extension or new CCGT at Costa Sur	Accepted - Contract extension	EcoEléctrica contract extension through 2032. Maximum capacity increases to 530 MW from 507 MW. No new CCGT at Costa Sur.
AES Contract	Contract cessation/retirement of AES by end of 2027	Accepted	Energy Bureau will consider conversion to natural gas during next IRP. (Note: this is not part of this IRP)



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Preliminary Activities for Ship Based LNG at Mayaguez for existing 4x50 MW gas turbines and possible new CCGT.	200 MW Mayaguez Peaker Conversion with Ship Based LNG delivery infrastructure.	Rejected	N/A
Preliminary Activities for Ship Based LNG at Yabucoa for new CCGT	302 MW CCGT at Yabucoa 2025 with Ship Based LNG delivery Infrastructure.	Rejected	N/A



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
MiniGrids (MG) and Other Transmission	\$5.9 Billions MiniGrid Transmission Investment on 115 & 38 kV system. \$1.9 Billions Transmission Reliability Investment.	Modified	Optimization Proceeding – New process to focus on one or two adjacent MiniGrid Regions and optimize transmission needs. Approved \$2 Billions for other non MiniGrid Investments subject to PREB's approval. \$5.9 Billions Investment if determined to be optimal.



Summary of PREPA's Proposed IRP/Action Plan vs. PREB's Determination

Element	PREPA's IRP	PREB's Determination	Modification
Distribution Hardening	\$911.5 Millions Distribution Investment (Substations & Feeders)	Accepted with conditions.	Must coordinate DG installation needs with this approach – voltage control, reconductoring, possible reconfiguration (i.e. Feeder configuration) Must coordinate with ongoing PREB's Integrated Distribution System Planning and PREB's approval. Feeder mainline undergrounding and substations upgrades to GIS



Capacity Retirements

Case ID	AES 1&2	Ag Steam 1&2	Ag CC 1&2	CS 5&6	Eco	PS 3&4	SJ 5&6 Conv Gas	SJ 7&8
S3S2B Low EE w/PPOA	1-2027	1-2020	1-2019	5-2020	Retire 2032	3-2022	5-2035	7-2021
	2-2027	2-2022	2-2021	6-2019		4-2023	6-2025	8-2023



Solar PV/Renewables, and Battery Storage RFP Tranches

RFP Target Release Date	Procurement Tranche	Solar PV or Equivalent Other Energy (MW)		4-hr Battery Storage Equivalent (MW ¹)	
		Minimum	Cumulative	Minimum	Cumulative
Dec-20	1	1000	1000	500	500
Jun-21	2	500	1500	250	750
Dec-21	3	500	2000	250	1000
Jun-22	4	500	2500	250	1250
Dec-22	5	500	3000	125	1375
Jun-23	6	750	3750	125	1500



Possible New Generation in Palo Seco

- The Energy Bureau **FINDS** that if solar PV and battery storage costs are roughly in line with the assumptions made for Scenario 3, and costs for a CCGT at Palo Seco remain as modeled (or are higher), then S3S2B is the lowest cost plan and should directly inform PREPA's Preferred Resource Plan. However, to protect against the uncertainty of near-future solar PV and battery energy storage price outcomes, or **other potential reliability concerns**, the Energy Bureau determined that PREPA may begin the preliminary work of a new fossil fuel-powered unit and/or energy storage at Palo Seco, subject to the constraints in the Modified Action Plan (Preliminary work approved for limited siting, permitting and feasibility analysis, up to \$5 million).