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Item	Short description from the order	Response
A-1	Concerning the ESM Resource Plan, provide an explicit request for a waiver of the requirement to use a capacity expansion model to develop optimized resource…	The ESM was developed utilizing a capacity expansion model with some decisions fixed. See Section 5.4 and workpaper "Considerations on the ESM Plan"
A-2-a	Explicitly identify which resource plan elements of the ESM were subject to optimization in the capacity expansion model, and which were not a result of any optimization runs	See work paper "Considerations on the ESM Plan" and Part 5 Section 5.4
A-2-b	What are the specific “several generation expansion additions” referenced in the first sentence 0n page 8-34 ofthe IRP Main Report?	Updated in Section 8, ESM Plan.
A-2-c	What is "The corresponding least cost capacity expansion plan [LTCE]...” referenced in the first paragraph on page 8-34 of the IRP Main Report	Clarified, it is the ESM's LTCE's see Section 8, ESM plan.
A-2-d	What is the underlying qualitative and quantitative rationale for replacing all 18 existing Frame 5 GT’s, “...as a fixed decision to come online by 2021 and with containerized LNG as a fuel option (418 MW total)"?	See workpaper "Considerations on the ESM Plan"
A-2-e	What are the underlying qualitative and quantitative rationales for including each of the four LNG-fueled resources listed in the four sequential bulletspoints on page 8-34 that start with “Develop an LNG terminal at Yabligloa 2-57 Tl (Caguas) and a 302 MW F-Class CCGT in Iune 2025 to be built aslaffiXed" decision"?	See workpaper "Considerations on the ESM Plan"
A-2-f	Confirm, or explain otherwise, that the only basis for the fixed payment reduction for EcoEléctrica is that such reduction "is enough for it to be competitive with the CCGT option”	See section 4.2.1.5 and section 8.2.12
A-2-g	On what basis is it assumed that the EcoEléctrica unit is , and state with precision the modeled resource characteristics that underlie the meaning of “fully flexible for cycling"	See section 4.2.1.5 and section 8.2.12
A-2-h	What are the underlying reasons for the solar and storage limitations stated on page 8-34 ofthe IRP Main Report for the ESM Plan? Include in this response any specific, detailed information PREPA is aware of that would limit near-term or longer-term availability of these resources.	The ESM was modeled without these limitations in this version of the IRP however see work paper "Considerations on the ESM Plan"

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A-3	The underlying resource plans arising from LTCE model runs all presume that any new gas-fired resource relying on San Iuan land-based LNG infrastructure would be "assumed to bear only its portion of the total terminal costs";1 those total costs are estimated at $492 million including a pipeline to Palo Seco.	In the updated runs the CCGT at Palo Seco had to carry 100% of the cost of the pipeline (25 million) and the land based LNG at San Juan was sized and priced so that it would provide enough gas for both the San Juan 5&6 CC and on F-Class at Palo Seco to be dispatched at full capacity simultaneously (457 million). See workpaper PREPA Fuel Price Designation (Conversion Details)_v2.xlsx. This was also explained in the report (section 10.1.6)
A-3-a	S4FCS2B. Provide a re-run of the original S4SZB scenario changing the LNG infrastructure cost parameter.	Done as per the answer above
A-3-b	S4FCS3B. Provide a re-run of the original S4S3B scenario changing the LNG infrastructure cost parameter.	Done as per the answer above
A-3-c	S3FCS2B. Provide a re-run of the original S3SZB scenario changing the LNG infrastructure cost parameter.	Done as per the answer above
A-3-d	S3FCS3B. Provide a re-run of the original $383B scenario changing the LNG infrastructure cost parameter.	Done as per the answer above
A-3-e	S5FCS1B. Provide a re-run of the original $383B scenario changing the LNG infrastructure cost parameter.	Done as per the answer above
A-3-f	SSFCS1S5B. Provide a re-run of the original SSSlSSB scenario changing the LNG infrastructure cost parameter.	Done as per the answer above
A-3-g	S4FCS2B_Renew. Provide a re-run of the original S4SZB scenario changing the LNG infrastructure cost parameter and the solar PV and battery storage availability parameters (2019-2021), and the wind performance parameters.	Cases re-run with higher limits to achieve compliance with Act 19-2017
A-3-h	S4FCS3B_Renew.	Cases re-run with higher limits to achieve compliance with Act 19-2017
A-3-i	S3FCS2B_Renew.	Cases re-run with higher limits to achieve compliance with Act 19-2017
A-3-j	S3FCS3B_Renew.	Cases re-run with higher limits to achieve compliance with Act 19-2017
A-3-k	S5FCS1B_Renew.	Cases re-run with higher limits to achieve compliance with Act 19-2017
A-3-l	S5FCS1BS5B_Renew.	Cases re-run with higher limits to achieve compliance with Act 19-2017
B-1	Conduct a series of Resource Plan Sensitivity Analyses as follows, applying cost based sensitivities in the manner required by Regulation 9021. The Regulation requires leaving the resource plan resulting from the LTCE "constant" and changing the cost-based variables according to the sensitivity definition.2	Done sensitivities carried out maintaining the expansion plan as per the LTCE

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B-1-a	Create a new sensitivity in which PREPA faces the full cost of land-based LNG in San Iuan and apply it in each case where resources dependent on land-based LNG at San Iuan are selected. Ifthis sensitivity adds the same fixed cost to each case where it applies, PREPA may simply identify which cases it applies to.	Done see answer to question A-3
B-1-b	Apply sensitivities 1, 5, and 6 to the ESM plan, to Scenario 4 Strategy 2, and to any other Scenario or Strategy that PREPA draws upon to develop its Preferred Resource Plan. Ensure that these sensitivities are applied such that the resource plan from the scenarios is held constant.	Done sensitivities to low renewable prices, high gas prices and high renewable prices applied to S1S2B, S4S2B, S5S1B and the ESM.
B-1-c	Apply sensitivities to S3S2 and S3S3 that hold the resource plan constant but use reference level costs for the solar PV and BESS resources.	Also sensitivity to mid prices was applied to S3S2B. PREB required this only to be applied to the lower cost between Strategy 2 or 3.
C-1	Provide and specify in tabular and, as necessary, narrative form all elements of a Preferred Resource Plan selected from and informed by resource plans developed and evaluated in optimization and sensitivity analyses, including specified new scenario and sensitivity analyses contained in this Resolution and Order.	See Action Plan
C-2	Provide a detailed discussion of each ofthe factors in Section 2.03 [H] [2][d] (ii) of Regulation 9021, and the results of the optimization and sensitivity analyses, if PREPA chooses a plan that is not the lowest cost. This discussion must address in detail any underlying reliability, interconnection, curtailment or other reasons given in support of a plan that is not least cost	See Action Plan
C-3	Include a detailed explanation as to why the proposed minigrid configuration provides an optimal balance between ratepayer costs and improved reliability and resilience. This explanation should include a quantitative assessment of the marginal reduction in quality of service [e.g., increase in VOLL) from completing one or more examples of partial minigrid investments [such as a minigrid , configuration only for the island's major economic and population centers].	Analysis provided in Section 2.15 of Appendix 1

II. Previous Energy Bureau Orders

Item	Short description from the order

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A-1	Incorporate new model runs of Scenario 1 as modeled by PREPA (namely, with "no new natural gas delivery infrastructure"), with one change: the contracted conversion 0f San Juan 5 & 6 to ship-based natural gas shall be included as a fixed resource, in a consistent fashion to how it has been included in the other scenarios. Apply this change to each of the strategies and sensitivities included. [Sensitivity 4 may no longer be required.)	Done, no new infrastructure in the south considered. The case retained EcoEléctrica and in some cases Cost Sur as well.
A-2	Provide a new model run Scenario 1A that models "no new gas-fired generation." This scenario would be defined as including no construction of new generating facilities that burn natural gas, and no new natural gas delivery infrastructure. Dual-fuel generators would be allowed (including peakers that could use trucked natural gas or diesel]. The scenario would also allow fuel conversion of existing generators to burn natural gas, and the continued operation of and contracts for generation at EcoEléctrica. As with Scenario 1, the contracted conversion of San Iuan 5 & 6 to ship-based natural gas shall be included as a fixed resource, in a consistent fashion to how it has been included in the other scenarios. Complete a "Nodal Run" and PSSE analysis of case SlASZB.	Done according to clarifications in order 4/5
B-1	Incorporate model runs for Scenario 2 under Strategies 2 and 3, with Base, High, and Low load. Test the impacts of uncertainties by applying sensitivities 5 and 6 [with fixed resource plans derived from theS2S2 case with base load). Complete a "Nodal Run" and PSSE analysis of case S2S2B.	Done according to clarifications in order 4/5
C-1	Re-run all Scenarios under the previously Ordered Solar and Battery Storage Availability limitations, modifying the limitations 1n place for solar PV and battery storage for the period 2019 to 2021, to reflect the following:	Limits adjusted for compliance with Act 17-2019
C-1-a	Document PREPA's calculation of the minimum amount of solar PV and battery energy storage that its models must allow to be deployed in 2019, 2020, and 2021 to comply with the Energy Bureau's November 9…	Limits adjusted for compliance with Act 17-2019
C-1-b	Provide a more detailed justification for the annual assumptions on the limitatiqns 1 4 ofsolar and battery deployment for each of years 2019, 2020, and 2021.	Limits adjusted for compliance with Act 17-2019
C-1-c	PREPA has provided no justification for its solar and battery limitations imposed for 2022 forward. PREPA must re-run all Scenarios to remove the solar PV and battery availability limitations for post-2022.	Limits adjusted for compliance with Act 17-2019

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D-1	Provide a detailed justification (including external references) for any cost adder utilized for wind and/or solar PV	The only cost adder was 16% as per the Department of Defense. See Part 6
D-2	Utilize consistent cost and performance assumptions for both wind and solar PV in all model runs.	Wind added as an option in all LTCE runs. Selected only in a very few cases with low cost of renewable.
D-2-a	Re-run all Scenarios with consistent wind cost and Wind performance parameters taken from the 2018 NREL ATB for wind resource group TRG-8, accounting for performance (i.e., annual capacity factors] that aligns with the potential in-service date of the wind resource.	Wind added as an option in all LTCE runs. Selected only in a very few cases with low cost of renewable.
D-3	Provide full and clear documentation of the presumed wind and solar output profiles.	See section 6.7

III. Additional Ordered Items

Item	Short description from the order	
A	Provide a more complete discussion regarding how the price of natural gas imported to Puerto Rico'lS (or lS not] coupled with the cost of various U. S. markets, such as the Henry Hub natural gas price. PREPA should describe in detail how this relationship lS reflectedin the gas price projections used for its IRP analysis. This discussion should address, but not be limited to, the following questions. Does PREPA assume that jones Act- compliant LNG ships will be available? Does PREPA assume that the price of LNG as a global commodity from sources other than the U. S. will be coupled with the Henry Hub price? If so, through what mechanisms would this coupling take place, and when? If not, what is an appropriate benchmark for non- U. S. LNG prices as delivered to Puerto Rico?	See updated section 7.2.5
B	Provide explanation as to why PREPA chose to model energy efficiency acquisition as stopping after 10 years, and discussion of what the impact of continued acquisition after that period would have on the IRP results.	Modeled extending to 2037 2%/year. See Appendix 4.

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C	Provide a more careful assessment of offshore wind alternatives for inclusion as a resource offering in this IRP. Dramatic price reductions have been seen for recent offshore wind solicitations in the Northeast US, relative to prices seen for the first offshore wind farm in the US (COD 2016) and relative to prices in Europe for earlier installations.	See section 6.8