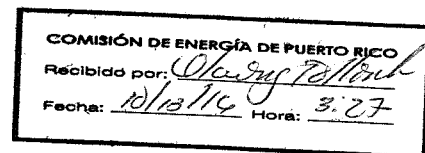


COMMONWEALTH OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION



IN RE: INTEGRATED RESOURCE
PLAN FOR THE PUERTO RICO
ELECTRIC POWER AUTHORITY

No.: CEPR-AP-2015-0002

SUBJECT: PREPA's Verified Motion
for Reconsideration of Provisions of
the Final Resolution and Order

**PREPA'S VERIFIED MOTION FOR RECONSIDERATION OF
PROVISIONS OF THE FINAL RESOLUTION AND ORDER**

October 13, 2016

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Comes now the Puerto Rico Electric Power Authority ("PREPA") and submits its Verified Motion for Reconsideration (the "Motion") of Provisions of the Final Resolution and Order issued by the Puerto Rico Energy Commission (the "Commission") on September 23, 2016 (the "Final Order"). The Motion is brought under the Final Order and all applicable legal authorities.¹ The Motion incorporates supporting attachments and affidavits attached hereto.

I. INTRODUCTION AND SUMMARY

1. PREPA appreciates the efforts of the Commission and intervenors to establish an Integrated Resource Plan ("IRP") and, in particular, an Action Plan for the next five years.

2. PREPA respectfully submits, however, that the Final Order: (1) makes two rulings that need to be rescinded because it is not possible for PREPA to comply; (2) makes a number of rulings that need to be modified or clarified in the interests of environmental law compliance, to avoid unnecessary generation development and/or transmission costs, or for reliability; and (3) makes a number of findings that should be corrected or modified.

¹ The Motion is brought under the Final Order, pp. 97-98; 3 L.P.R.A. §§ 2164, 2165 (Sections 3.14 and 3.15 of Act 170-1988, the Uniform Administrative Procedure Act); Acts 83-1941, 57-2014, and 4-2016, including but not limited to Section 6B(h) of Act 83-1941 as added by Act 57-2014 and as amended by Act 4-2016; Regulation No. 8594, Section 3.07; Regulation No. 8543, Section 11.01; and all other applicable authorities.

3. **The Final Order's directives to PREPA to pursue permitting of a large new combined cycle ("CC") unit at Aguirre, and permitting of repowering of Aguirre CC units 1 and 2, should be rescinded.** PREPA cannot comply. The Order calls on PREPA simultaneously to pursue (1) permitting, engineering, and planning of the Aguirre Offshore Gas Port ("AOGP") and the conversions to natural gas fuel of existing Aguirre thermal (steam) units 1 and 2 and CC units 1 and 2, which should be pursued; plus (2) permitting of a large new CC unit at Aguirre to replace the thermal units and the repowering of Aguirre CC units 1 and 2 as an alternative. Requesting both sets of permits simultaneously is inconsistent with current laws and regulations. That is beyond PREPA's and the Commission's control. See Section II of this Motion.

4. **The Final Order should be modified to approve fully AOGP and the conversions to natural gas fuel of existing Aguirre thermal and CC units.**

- a. The Order directs PREPA to pursue permitting, engineering, and planning of AOGP, and permitting of the conversions,² subject to a \$15 million cap, and not to perform work beyond those steps until further notice.
- b. Those rulings disrupt PREPA's efforts and plan to move into compliance with the United States Environmental Protection Agency's ("US EPA") Mercury and Air Toxics Standards ("MATS"), 40 C.F.R. Parts 60 and 63, which were adopted under the federal Clean Air Act, 42 U.S.C. § 7401, *et seq.* The Order fails to recognize adequately that PREPA's Action Plan, including those projects, is driven by MATS compliance, and the Order also misapprehends or misses various critical points relating to the Action Plan and MATS compliance. The Order will delay MATS compliance. PREPA needs to comply with the law, as soon as feasible, in order to avoid exposure during an extended period to civil and criminal penalties, citizen suits, cease or desist Orders, and to provide environmental justice to neighboring communities.

² In some spots, the Final Order refers to permitting of the conversions, but on page 79 it refers to permitting, engineering, and planning of the conversions.

- c. The ruling on AOGP relies on three main reasons. (The ruling on the conversions is based solely on the ruling on AOGP.) The rulings appear to rely primarily on the premise that PREPA failed to make required use of a “capacity expansion model” and over-used its and its independent IRP consultants Siemens PTI’s professional judgment. That premise is incorrect, and it is an insufficient ground for the rulings, for multiple reasons. The rulings rely secondarily on the premise that variations in fuel prices yield uncertainty whether AOGP is economic in some scenarios. The Order’s own findings and the facts show, however, that AOGP provides cost savings on a wide range of fuel price scenarios. The third reason, permitting uncertainty, is not a reason to withhold full approval.

See Section III of this Motion.

5. The Final Order should be modified regarding new generation at Palo Seco.

- a. The Order prematurely limits construction to one new unit. That ruling will significantly increase development, generation, and transmission costs. In addition, the MATS compliance schedule in the North will be delayed. The Order also creates significant reliability risks. PREPA should be allowed to proceed as to three units at this time. The decision whether to procure and construct one, two, or three units should be made, in collaboration with the Commission, at the time when the technical permitting studies allow for filing permit applications for construction of new emission units at Palo Seco, alongside with system load demand monitoring.
- b. The Commission also should clarify that the ruling on new generation at Palo Seco is intended to call for dual fuel capable units with the resulting capacity as per system load demand monitoring dictates, and that it is not intended to mandate a particular configuration, i.e., that it does not mandate a 1x1 configuration (one generator to one steam turbine). Such a mandate would hinder PREPA’s flexibility in arriving at the best results in design configuration, capacity, and available technologies, all in pursuit of optimizing efficiency, maintenance costs, operational flexibility, and capital expenditures.

See Section IV of this Motion.

6. The Final Order should be modified with respect to the schedules for (1) retirements of Palo Seco 1 and 2, Costa Sur 3 and 4, and San Juan 7 and 8; and (2) the designation as “limited use” under MATS of San Juan 9 and 10. The Order directs that those retirements should begin as soon as feasible and must be completed by December 31, 2020, and

directs the limited use designation apparently in a prompt manner. PREPA needs more flexibility in the timing, in order to make sure that the retirements and designation do not impair reliability and to avoid unnecessary costs. See Section V of this Motion.

7. **There are three other subjects on which the Final Order's rulings should be modified or clarified, for practical reasons:** (1) the data and records retention and collection requirements, (2) renewables contracts and the renewables independent audit, and (3) inconsistent and overlapping directives regarding the timing of reports on environmental subjects. See Section VI of this Motion.

8. **The Final Order also includes findings that should be corrected, modified, or supplemented on several other subjects,** including but not limited to: (1) PREPA's demand (load) forecasts; (2) PREPA's reserve margin; (3) PREPA's independent IRP consultants, Siemens PTI; (4) the IRP's compliance with the Commission's IRP Rule (Regulation ["Reg."] No. 8594) and other compliance issues; (5) Puerto Rico's wind potential; and (6) the Appendix A Timeline and History of the Proceeding. See Section VII of this Motion.

9. **Please note that PREPA does not agree with the Final Order's overall conclusion that the IRP did not comply fully with the Commission's IRP Rule** (Reg. No. 8594) and the Order's subsidiary points regarding non-compliance or delayed compliance. PREPA has placed the discussion of that subject near the end of this Motion, however, for two reasons. First, the primary focus of this Motion is on specific rulings in the Final Order that need to be changed because they are not possible, to allow environmental law compliance, to avoid unnecessary generation development and/or transmission costs, or for reliability. Second, the discussion of the subject of compliance will draw on many points that are made in the discussion of multiple rulings that need to be changed.

10. Finally, please note that while the body of this Motion presents and supports PREPA's requests for reconsideration, **the Motion also incorporates attachments and verifications that provide further detail and support.** PREPA is presenting further detail and support through the attachments, in order to avoid preparing a motion that has a body that is unduly lengthy, and to improve readability and avoid confusion. The material in the attachments and the affidavits are incorporated in, and should be considered as part of, the Motion for purposes of proceedings on reconsideration and judicial review.

11. This Motion includes certain analyses and data that are presented to justify PREPA's request for reconsideration, and are not intended as an attempt to include new evidence into the record.

II. THE COMMISSION SHOULD RESCIND THE DIRECTIVES THAT PREPA SEEK PERMITTING OF A LARGE NEW CC UNIT AT AGUIRRE, AND REPOWERING OF AGUIRRE CC UNITS 1 AND 2, BECAUSE PREPA CANNOT COMPLY

12. The Final Order, in brief: (1) approves PREPA's continued work on permitting, engineering, and planning related to AOGP, subject to a \$15 million cap; and (2) approves PREPA's continued work on permitting of conversions to natural gas fuel of existing Aguirre thermal units 1 and 2 and CC units 1 and 2, subject to the same \$15 million cap;³ but also (3) directs PREPA to begin work on permitting of a large new CC unit at Aguirre, as an alternative to replace Aguirre thermal units 1 and 2; and (4) directs PREPA also to pursue permitting of repowering of Aguirre CC units 1 and 2 at this time; as well as (5) providing PREPA an additional procedural mechanism of submitting a new analysis to the Commission in

³ As noted earlier, in some spots the Final Order refers to permitting of the conversions, but on page 79 it refers to permitting, engineering, and planning of the conversions.

support of AOGP and the conversions, apart from and later than the motion for reconsideration process.⁴

13. PREPA respectfully submits that the Commission should reconsider and rescind (1) the directive to pursue permitting of a large new CC unit at Aguirre to replace the thermal units and also (2) the directive to pursue permitting of repowering of the CC units at this time.⁵

14. Simultaneous pursuit of permits for (1) AOGP and the Aguirre conversions, (2) a large new CC unit at Aguirre as an alternative to replace the thermal units and the repowering of the CC units is inconsistent. They involve the same objectives, the same site, and affect the same (and competing) generation units.

15. PREPA cannot seek the above mentioned permits at the same time. The regulations under the federal National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4321, *et seq.*,⁶ and Puerto Rico’s Environmental Public Policy Act, Act 416-2004 (as amended),⁷ do not allow the parallel evaluation of two or more environmental documents intended for the same objective at the same site and affecting the same generating units. In the case of a construction permit, US EPA and the Puerto Rico Environmental Quality Board (“PREQB”) will not

⁴ Final Order, pp. 2, 24, 25, 25-26, 26, 27-30, 31-35, 38-39, 40-44, 64-76, 77-79, 84-85, 85, 89, 93-96. PREPA does not object to the additional procedural mechanism, but, because the Order directs actions with which PREPA cannot comply and time is of the essence, PREPA is pursuing this subject immediately in this Motion while also preserving its right to invoke the additional mechanism. PREPA plans to pursue the additional mechanism if needed, and does not waive its right to do so.

⁵ PREPA’s IRP provides for new units at Aguirre, and repowering, but those projects are to be conducted in later years. Those are different subjects and do not cause the same problems.

⁶ Each agency has a regulation for NEPA compliance. The applicable regulation for a specific project is determined by the process leading agency. In the case of AOGP, the leading agency is FERC, and the applicable regulation is 18 C.F.R. § 380, *et seq.* Section 380.12 of that regulation requires the each permit applicant submits several environmental reports on which the environmental impact statement (“EIS”) is based. Opting for the construction of a large new CC unit alternative, or the repowering, at this time instead of the currently proposed natural gas conversion project, will derail the permitting process for AOGP, because new environmental reports with new data would be required, rendering moot or undermining the permitting processes conducted to this day.

⁷ Chapter VII, Rules 111.F.3 and 112.D.2, of the Regulation for the Evaluation and Processing of Environmental Documents.

simultaneously initiate or conduct two parallel, different permitting processes for the same site and purpose and affecting the same emission sources. Thus, the agencies will not allow PREPA to initiate permitting of the large new CC unit at Aguirre to replace the thermal units and/or the repowering of the CC units, because the permitting of AOGP and the conversions is pending. That is not a matter in PREPA's or the Commission's control.

16. It is not clear to PREPA if the Commission consulted the applicable regulatory environmental legal authorities / agencies or understood the feasibility and impacts of implementing these aspects of the Final Order. PREPA will not be able to pursue a construction permit for the large new CC unit to replace the Aguirre thermal units and the repowering of the existing CC units without first requesting that the PREQB cancel the permit application submitted in 2013 for the Aguirre Power Complex Conversion Project (which included the AOGP construction and the conversion of Aguirre thermal units 1 and 2 and Aguirre CC units 1 and 2). Approving construction of the large new CC unit and/or the repowering of the current CC units would have a negative impact on PREPA's efforts to comply with MATS, because PREPA will need to initiate a new licensing process.

17. See also Attachment A hereto, which is official agency (Office of Permit Management ["OGPe"] and PREQB) correspondence confirming the above point.

18. In addition, the Final Order lacks essential details about the proposed large new CC unit at Aguirre, and its dual fuel capability for natural gas use. If the idea is a pipeline from EcoEléctrica to Aguirre, that is not an available option under the current *de facto* public policy. See Section III(B)(2), below.

19. In addition, AOGP and the conversions should be fully approved, as discussed in Section III, below. If AOGP and the conversions are fully approved, then the alternative of a

new large CC unit at Aguirre to replace the thermal units and the CC units repowering is unnecessary and undesirable at this time. Those projects are to be implemented during a different (later) stage of the IRP, as originally proposed by PREPA.

20. Accordingly, the Final Order should be revised to remove the directives to pursue permitting of a large new CC unit at Aguirre to replace the thermal units and the repowering of the CC units, at this time.

III. THE COMMISSION SHOULD FULLY APPROVE AOGP AND THE CONVERSIONS TO NATURAL GAS AT AGUIRRE

21. The Final Order limits approval of AOGP and the conversions to natural gas of existing Aguirre thermal units 1 and 2 and CC units 1 and 2 to work on permitting, engineering, and planning at this time, as discussed in Section II, above.

22. PREPA respectfully submits that the Commission should reconsider its rulings on this subject. The Final Order erred in not fully approving AOGP and the conversions, for the reasons discussed in Section III(A) and (B), below, and that are further supported by Attachments B through E, referenced below.

A. The Primary Purposes of AOGP and the Conversions Are Their Critical and Integrated Roles in PREPA's MATS Compliance Efforts

23. PREPA respectfully submits that the Final Order acknowledges, but ultimately does not take into account, the undisputed fact that the primary purposes of AOGP and the conversions to natural gas of existing Aguirre thermal units 1 and 2 and CC units 1 and 2 are their roles as critical and integrated elements of PREPA's overall effort to move into compliance with US EPA's Mercury and Air Toxics Standards, 40 C.F.R. Parts 60 and 63.

24. PREPA, in each of the IRP submissions and throughout this IRP case, has stressed that AOGP and the conversions are driven by MATS compliance. That fact is

documented in the August / September 2015 “Base IRP”; the Commission’s official Minutes of the Clarification meeting of December 22, 2015; the March / April 2016 Supplemental IRP; the Technical Conference on April 6, 2016; and the Oral Argument on May 13, 2016.⁸

25. MATS compliance is essential because it is required by federal law. That objective also is vital due to the significance of the environmental concerns addressed by MATS and the interests of the people of Puerto Rico. Non-compliance with MATS would expose PREPA to civil and criminal penalties, citizen suits, cease or desist orders, and would delay environmental justice to neighboring communities.

26. The Final Order finds that PREPA did not provide sufficient information regarding the Action Plan and environmental topics, in general, and the MATS plan and MATS compliance, including the status of negotiations with US EPA (and the US Department of Justice (“US DOJ”)) and whether retrofits, in particular, could be used for MATS compliance. *See, e.g.*, Final Order, pp. 6, 20, 55-57. Those findings are not warranted in two senses.

27. First, the Final Order’s findings do not reflect the totality of the large amount of information available to the Commission regarding the Action Plan (especially in relation to the Supplemental IRP and discussions at the April 6, 2016, Technical Conference and the May 13,

⁸ *See, e.g.*, the August / September 2015 “Base IRP”, Vol. 1, Executive Summary, pp. 1-2; Vol. 1, Fuel Infrastructure Review, Overview of Key Findings, p. 5-2; Vol. 1, Fuel Infrastructure Review, HFO/No. 6 Oil, p. 5-18; Vol. 1, Three Supply Portfolios, MATS Compliance, pp. 7-10 and 7-11-7-12; Vol. 1, Supply Portfolios and Futures Results, Environmental Compliance Summary, pp. 8-33, 8-49, 8-61; Vol. 4, Table 1-2, p. 1-2. *See also* the Commission’s official Minutes of the December 22, 2015, clarification discussion, p. 8. *See also* the March 2016 Supplemental IRP, Action Plan, MATS Strategies, p. 9-4; MATS Compliance, pp. 9-4-9-5; the Siemens PTI presentation at the April 6, 2016, Technical Conference, pp. 4, 5, 10, 16, 24; and the PREPA/Siemens PTI presentation at the May 13, 2016, Oral Argument, pp. 3 and 4, which shows for the Base IRP and the Supplemental IRP, respectively, that the driver for AOGP and the conversions (as well as other elements of the Action Plan) is MATS compliance.

2016, Oral Argument) and the MATS plan and MATS compliance (throughout this case). See also Section II, above.⁹

28. The high level of essentials of the MATS compliance plan are clear:

- a. Conversion to natural gas of existing Aguirre thermal units 1 and 2 and CC units 1 and 2 in conjunction with the construction of AOGP;
- b. Designation of limited use of Palo Saco units 3 and 4 after the new CC units at Palo Seco are in service and transmission reinforcements completed;
- c. Transmission system reinforcements and improvements;
- d. Designation as limited use, and eventual retirement, of Palo Seco units 1 and 2, Costa Sur units 3 and 4, and San Juan units 7 and 8, handled and timed in a prudent manner that takes into account other considerations, including reliability.
- e. Designation as limited use of San Juan units 9 and 10, subject to handling and timing in a prudent manner.

29. Combined cycle units were selected over simple cycle turbines because of the former's proven higher thermal efficiency. *See, e.g.*, Base IRP, Vol. 1, pp. 3-7 and 8-8. Reciprocating engines also were considered. *See, e.g.*, *id.*, p. 3-7.

30. Retrofitting as a MATS compliance strategy also was considered, but it is not feasible or economically practical, and it also fails to achieve other objectives, as was discussed,

⁹ The Final Order's ruling and findings relating to MATS and MATS compliance also contain some other errors, such as the direction of permit efforts that are not possible, discussed in Section II, above, and the suggestion that SO² is regulated by MATS (Final Order, p. 55).

for example, at the April 6, 2016, Technical Conference by Siemens PTI and confirmed there by the National Public Finance Guaranteed Corp. group of intervenors' ("National") IRP expert.

31. PREPA explained that its evaluation of the implementation of emissions controls or air pollution control systems for MATS compliance was that it is not feasible, not just because it did not meet the cost-effectiveness criteria, but also because of other reasons or constraints that are far more important. These are:

- a. The installation of air pollution control systems for MATS compliance targets only one type of pollutant: particulate matter ("PM"). As it is widely known, the installation of baghouses or dry electrostatic precipitators ("DESP") to control PM do not control the emission of other type of pollutants emitted by PREPA's generating units, such as CO₂, SO₂ and NO_x. Therefore the air pollution control systems alternative was found not to be feasible because it does not support compliance with other current and future environmental laws and regulations applicable to PREPA's generating units.
- b. The alternative of emissions controls installation does not support other non-environmental laws, regulations, or initiatives that seek to increase renewable sources integration, and fuel diversification and energy efficiency, among others.
- c. The implementation of the emissions controls alternative may resolve PREPA's generating units MATS compliance status, but will certainly exacerbate other environmental impacts related to soil and water pollution. For example, in the case of the Aguirre Power Complex, wet electrostatic

precipitators (“WESPa”) will require PREPA to increase the process water consumption that is currently extracted from the Southern Aquifer. As stated, this aquifer is currently in critical state due to saline water intrusion and contamination with agricultural products, based on Department of Natural and Environmental Resources (DNER) reports that were submitted to the Commission.

- d. The exponential increase in ash disposal as a result of a much higher PM removal by an ESP will pose a higher burden on the already low capacity availability to manage in the existing industrial landfills available in Puerto Rico.

32. Those systems also would not support other objectives, such as renewables integration and higher efficiency generation.

33. Second, those findings of the Final Order are vague and do not indicate what specific additional information, if any, was necessary. If the real focus here is that PREPA should have provided more information about the negotiations with US EPA (and US DOJ), then that is not justified and it is a “Catch-22” for PREPA, because it fails to take into account that the US EPA was and is awaiting the final outcome of this IRP case. As stated during the April 6, 2016, Technical Conference, US EPA conditioned continuing negotiations on approval of the IRP. An approved and technically feasible IRP is the key element to determine a clear path to MATS compliance and to be able to estimate the likely outcome of any negotiation with US EPA (and US DOJ).

34. The Final Order, at least at one point, on page 24, recognizes that the primary purpose of AOGP is MATS compliance, and that cost savings are a second purpose.

35. However, the Final Order nonetheless assesses AOGP and the conversions essentially from a least cost perspective, rather than viewing them in the context of PREPA's efforts to comply with MATS. *See, e.g.*, Final Order, pp. 77-79, 95 (Findings 22, 23, and 24). That point is discussed further in Section III(B), below.

36. Least cost planning is the general or primary focus of typical IRP processes, but PREPA's situation is unusual in many respects, as discussed further in Section III(B)(1), below. In brief, among other things, PREPA is out of compliance with MATS at many generating stations, plus it has a severely constrained financial situation, concerns about reliability (adequacy) in the North, limits on its transmission system, especially South-North, as well as other constraints. Thus, as to the Action Plan, including but not limited to AOGP and the conversions, this IRP case is not a typical IRP case.

37. The Final Order's misplaced focus leads to rulings on this subject that disrupt PREPA's work on these projects and its overall work on MATS compliance. If the Commission decides to finally disapprove the construction of AOGP and instead approves the construction of the large new CC unit, it will adversely impact, and significantly delay, PREPA's ability to comply with MATS, because PREPA will be required to initiate a whole new licensing process. That option will delay PREPA's MATS compliance by approximately 3-4 additional years in comparison to the alternative of completing the current AOGP permitting and construction process. Such delay will result in the risk of additional costs due to civil penalties estimated to be approximately \$279,843,750. *See* Attachment B hereto. Consequently, the Final Order dramatically enhances the scope of PREPA's Clean Air Act liabilities or risks. That burden will ultimately be passed on to PREPA's customers. Also, PREPA's preferred alternative significantly represents the best multi-pollutant emissions reduction profile and provides an

environmental justice relief to the Aguirre Power Complex neighboring communities, by substantially reducing criteria air pollutants emissions.

38. The Final Order also is in error because it reflects, or ascribes to PREPA, an assumption that the likelihood of PREPA incurring fines or other penalties as a result of non-compliance with MATS is non-existent or low, on the theory that PREPA is negotiating with US EPA on how to avoid penalties. *See* Final Order, pp. 20, 56. That is incorrect. PREPA has made no such statement. PREPA is in negotiation with US EPA about coming into compliance with MATS, but that does not change the fact that PREPA is at risk of significant fines and penalties. The statutory maximum penalty for violations of the Clean Air Act of this type is \$37,500 per day, per violation for violations that occurred before November 2, 2015, and \$93,750 per day, per violation, for violations occurring thereafter and assessed on or after August 1, 2016.¹⁰ Consequently, the Final Order dramatically enhances the scope of PREPA's potential Clean Air Act liability and the risk of major penalties.

39. Also, there are other environmental considerations that the Commission did not sufficiently weigh in its decision regarding the Aguirre Power Complex that will affect compliance with other laws and regulations, such as the Clean Power Plan, the new 1-hr SO₂, and National Ambient Air Quality Standards ("NAAQS") Standard.¹¹ PREPA's preferred plan protects consumers from the volatile fossil fuel prices of Bunker C and Diesel by diversifying PREPA's fuel sources with natural gas. The Aguirre conversions and AOGP in PREPA's preferred plan are particularly important to a more diverse, less price-volatile, and more

¹⁰ *See* 40 C.F.R. §19.4 tbl. 2 (adjusting the penalties in 42 U.S.C. § 7413(b)).

¹¹ *See* 40 C.F.R. § 50.4(a)-(b) (annual and 24-hour SO₂ standard); *id.* § 50.5 (secondary SO₂ standard); *id.* § 50.17 (1-hour SO₂ standard); *see also* 40 C.F.R. Part 50 (other NAAQS); 40 C.F.R. Part 60, Subpart UUUU (Clean Power Plan).

environmentally friendly fuel mix. PREPA's IRP would dramatically improve its emissions profile by almost all NAAQS pollutants. That was clearly expressed in the Final Environmental Impact Statement ("FEIS") issued by the Federal Energy Regulatory Commission ("FERC"). See page 1-3 of the FEIS, which is a public document, and which PREPA previously supplied in this IRP case. Also, AOGP and the conversions would provide an environmental justice relief to the Aguirre Power Complex neighboring communities, by substantially reducing criteria air pollutants emissions.

40. The Final Order (at p. 55) also states that "PREPA's IRP also failed to discuss the effects of other relevant air emissions standards, including the National Ambient Air Quality Standards [NAAQS] and potential air permitting issues at AOGP." That is not correct. The Order clearly overlooks the facts that AOGP has gone through a very strict and scrutinized FERC and OGPe licensing process, where all the applicable regulatory environmental agencies have participated and thoroughly evaluated the AOGP project benefits and impacts. As a result, FERC and OGPe (the latter as a cooperating agency) issued the project's FEIS, referenced above. As part of the evaluation of environmental impacts and benefits during the FEIS approval process, both EPA and the PREQB considered the effects on other air emission standards, such as the NAAQS, and other potential air permitting issues for AOGP. PREPA respectfully submits that the Commission should have clarified any questions regarding these topics through requirements of information and/or the April 6, 2016, Technical Conference or the May 13, 2016, Oral Argument.

41. None of the discussion in this Section III(A) is intended to suggest that AOGP and the conversions do not provide economic benefits and savings. Those projects are economic, as indicated above and as discussed further in Section III(B), below. The point in Section III(A),

however, is that they are essential to PREPA's MATS compliance efforts. MATS compliance is not a choice, it is a legal mandate.

42. Accordingly, for the reasons reflected in this Section III(A), and the reasons discussed in Section III(B), below, the Final Order should be revised to approve fully AOGP and the conversions (and to eliminate the inconsistent directives discussed in Section II, above).

B. The Final Order's Key Findings Do Not Support the Ruling

43. The Final Order states in part: "The Commission cannot conclude that AOGP represents a least-cost, least-risk path for serving customers' needs and meeting Puerto Rico's energy policy goals based on the facts presented in this proceeding. There are three main reasons." Final Order, p. 77. The three main reasons are the Order's findings of: (1) "unreliable fuel forecasts", (2) "failure to test alternative portfolios", and (3) "permitting uncertainty". *Id.*, pp. 77-78.

44. Please note that the Final Order's not fully approving AOGP is the reason for the Order's not fully approving the Aguirre conversions. *See* Final Order, p. 79. Thus, if AOGP should be fully approved, as it should, then the conversions also should be fully approved.

1. The Work that Was Performed by Leidos and Siemens PTI, Including the Capacity Expansion Model Work

45. Although it is listed as the second "main reason", the Final Order's rulings on this subject (and the Order's general conclusion that the IRP did not comply with the IRP Rule, *see, e.g.*, Final Order pp. 4-5, discussed in Section VII(D), below) appear to rely primarily on the premise that PREPA was required to, but did not, use a particular kind of economic software, a "capacity expansion model", to generate data on the costs and benefits of AOGP and the Aguirre conversions.

46. That premise is both an incorrect and an insufficient basis for the Final Order's rulings on this subject, for many reasons. The first reason is that AOGP and the Aguirre conversions are driven by MATS compliance, as discussed in Sections II and III(A), above.

47. Four additional reasons are: (1) Siemens PTI's predecessor Leidos Engineering, LLC, used Strategist®, a capacity expansion model, and PREPA and Siemens PTI considered the Strategist results; (2) Siemens PTI also used PROMOD (PROMOD® IV) and other financial modeling that fit the needs and circumstances of this IRP and as well as using good professional judgment; (3) the unusual circumstances of this IRP mean that such a model would have to be highly constrained, or it would not be realistic, meaning that the IRP necessarily involved significant expert judgments, which is what Siemens PTI supplied, and not just software runs; and (4) the Commission's deficiency Orders and other communications did not advise PREPA and Siemens PTI that further use of a capacity expansion model, beyond that already performed by Leidos and taken into account by Siemens PTI, was mandatory for approval.

48. See also Section III(B)(2), below, which provides a sixth reason: the Final Order's own findings on AOGP's economics indicate that it will yield significant cost savings in a wide variety of fuel price scenarios and the Order's other analysis on the subject of fuel price scenarios is flawed.

a. Leidos' Use of the Strategist Capacity Expansion Model and Siemens' PTI's Consideration of the Strategist Results

49. In order to pursue transparency during the IRP process, PREPA determined to conduct an "RFP" to hire a third independent party. As a result, PREPA selected Leidos, who, among other things, used the Strategist capacity expansion model and prepared a first stage IRP, as is discussed further below. PREPA later conducted a second RFP, and selected Siemens PTI.

The sound reasons for each RFP and the resulting selections were discussed in detail at the April 6, 2016, Technical Conference. See also Section VII(C), below, regarding Siemens PTI. That does not mean, however, contrary to the inference that seems to be suggested on page 37 of the Final Order, that PREPA simply delegated its responsibilities to Siemens PTI. That is not the case. PREPA and Siemens PTI worked closely together, and all decisions were ultimately evaluated and approved for submission by PREPA.

50. On November 17, 2015, PREPA was asked, by discovery from the National group of intervenors (“National”) if a capacity expansion model such as Strategist was used before Siemens PTI used PROMOD. On December 7, 2015, PREPA provided an answer by Siemens PTI. Siemens PTI answered that it did not run its own analysis using a capacity expansion model, but that a prior study had been performed using Strategist and that it had provided a sound starting point that confirmed the technologies to be considered by PREPA for supply options, the convenience of replacing most of PREPA’s generation fleet by January 1, 2019. This document also provided in general the level of reserve necessary. PREPA explained that from a practical perspective this prior study resulted in unworkable timelines and capital expenditures. Based on these results, PREPA with the support of Siemens PTI made a detailed evaluation of options to develop a realistic plan, using expert opinion and professional judgment, and taking into account numerous important criteria (constraints) including, in brief: (1) natural gas availability and permitting status of AOGP, (2) sequencing of projects to achieve realistic use of PREPA’s management and engineering resources and suppliers’ and contractors’ resources, (3) compliance with environmental mandates such as MATS as soon as reasonably possible while maintaining reliability, (4) transmission constraints and the necessity to complete certain transmission upgrades before older generation could be taken out of service, (5)

anticipated project durations, (6) practical constraints on capital availability based on PREPA's current and forecasted financial situation, (7) capacity needs to replace generating units based on load forecasts, (8) the need to maximize system flexibility as early as practical to accommodate the daily production of renewables and to minimize renewables curtailment, and (9) cost benefits from maximizing long-term fuel efficiency and use of cost-effective fuels. Siemens PTI then conducted multiple PROMOD runs that allowed identifying impacts that the Capacity Expansion Model could not, as in the case of (1) representation of the transmission system, (2) variable O&M and fuel cost of the generating fleet under a Security Constrained Unit Commitment / Economic Dispatch, (3) renewable curtailment, and (4) resulting reliability impacts (Siemens PTI also performed much other work).¹²

51. On December 23, 2015, the Commission issued its Second Requirement of Information to PREPA. PREPA answered on January 12, 2016. "ROI" 2 asked about studies or reports generated by, commissioned by, or relied upon by PREPA to inform the Base IRP's portfolio resource decisions or the timing of those decisions. PREPA's answer included three studies, one of which was the First Stage IRP prepared by Leidos. ROI 2 asked various questions about work papers relied upon or generated by PREPA and its consultants. PREPA's answer, among other things, explained that "Siemens reviewed the First Stage IRP report based on Strategist results." PREPA's answer again discussed criteria (constraints) taken into account by Siemens PTI, and its use of expert opinion and professional judgment. ROI 2 asked about PREPA's own use of capacity expansion models. PREPA answered in part as follows:

¹² PREPA's Information Submission and Answers to Request for Production of Document, December 3, 2015, responding to discovery from intervenors National Public Finance Guarantee Corp., et al. *See also* PREPA's and Siemens PTI's October 15, 2015, responses to the Commission's September 24, 2015, First Requirement of Information, Requirement of Information ("ROI") 7.

PREPA uses the capacity expansion optimization modeling software Strategist® for long term planning. PREPA has not experienced load growth since 2006, thus no generating system adequacy studies have been required lately. The First Stage IRP of November 28, 2014 included a representation of the PREPA system in Strategist®. The Strategist® model was used to develop the capacity expansion plan for each of the three base case variations as explained in the First Stage IRP report. This report is provided in the attached Compact Disk (CD). The portfolios in the First Stage IRP allowed unrestricted commissioning of units in 2019. According to this assumption it is feasible to obtain the required permits, to order and receive the necessary equipment, to retire most of the current generation fleet, to demolish, to construct and interconnect all new units in a four year period; but this is not executable. Also, this failed to consider the system security and stability requirements of Puerto Rico's electrically isolated grid and other technical aspects that could affect the development process.

PREPA incorporates the above-referenced material by reference.

52. PREPA and Siemens PTI also discussed the use of the Leidos work, including use of the Strategist results, at the April 6, 2016, Technical Conference.

53. Thus, the facts are that Leidos developed a First Stage IRP using Strategist, and that PREPA and Siemens PTI considered that First Stage IRP, including the Strategist results, to account for factors that the First Stage IRP could not. See also Attachment D, referenced in the next subsection of this Motion. That attachment provides additional detail and support on methodologies employed.

54. The Final Order characterizes the IRP as having failed to use a capacity expansion model. *E.g.*, Final Order, pp. 5, 34-35. PREPA respectfully submits that that finding is not correct. Siemens PTI did not perform their own Strategist runs, but they did make use of the work of Leidos, including its Strategist results and key findings with respect of convenience of: (1) replacement of the PREPA's generating fleet, (2) level of capacity additions and resulting reserve, and (c) technology selected.

b. **The Use of PROMOD and Other Financial Modeling as well as Sound Expert Judgment that Fit the Needs and Circumstances of This IRP**

55. The Base IRP contains a wealth of information regarding the IRP. Volume 1 contains an immense amount of detail about the IRP. The Base IRP explains, among other things, that the IRP involves four different “Futures” and three different “Supply Portfolios”, and it discusses how PROMOD and other modeling relate to these analyses. For example, Base IRP, Vol.1, p. 1-2, states in part as follows:

Siemens team worked closely with PREPA management and its financial advisors in defining meaningful and plausible future scenarios and designing feasible supply portfolios. It is important to note that the assumptions reflect conditions as of June 30, 2015 including PREPA’s financial situation. Siemens utilized PROMOD and PSS®E in modeling the PREPA system and production costs.

PROMOD IV is the industry-leading Fundamental Electric Market Simulation solution, incorporating extensive details in generating unit operating characteristics, transmission grid topology and constraints, and market system operations. PROMOD IV performs a security constrained unit commitment and economic dispatch that is optimized with operating reserve requirements, similar to how ISOs set schedules and determines prices. PROMOD is the tool that PREPA uses to analyze the expected operation of its generating fleet and purchased power.

PSS®E is a trusted leader in the power industry for cutting-edge electric transmission system analysis and planning. Used in over 115 countries worldwide, including Puerto Rico, PSS®E is leading the market in advances in electric transmission modeling and simulation. PSS®E has multiple modules and the most relevant for this study are: a) Power Flow and Contingency Analysis: fast and robust power flow solution for network models up to 200,000 buses, fast steady-state contingency analysis, including automatic corrective actions and remedial action scheme modeling, automated PV/QV analysis with plot generation, and b) the PSS®E Dynamic Simulation module is a versatile tool to investigate system response to disturbances that cause large and sudden changes in the power system. The dynamic simulation module employs a vast library of built-in models for modeling different types of equipment, and with capability to create user defined models of any complexity. ****

The result of the IRP provides insight of generation resources that best meet PREPA’s system needs. The detailed analyses of the IRP are presented in the following five volumes of the IRP report....

56. Not only the Base IRP, but also PREPA’s and Siemens PTI’s responses to discovery, and the Supplemental IRP, discuss in great detail the additional work done using PROMOD and other financial modeling, as well as the use of expert opinion and professional

judgment. There is far too much information in those materials to summarize in this Motion, and too many documents, including voluminous documents, to attach. PREPA incorporates those materials by reference.

57. The facts are reflected in, for example, the prior subsection of this Motion; PREPA's and Siemens PTI's October 15, 2015, responses to the Commission's September 24, 2015, First Requirement of Information, in which, among other things, the answer to ROI 1 discussed its use of PROMOD and of a separate financial model for fixed operations and maintenance costs and capital costs; and the Supplemental IRP. Those models allowed assessing the performance of the Portfolios formulated based on (1) the results of the First Stage IRP, (2) permitting conditions of the AOGP, (3) capital availability restrictions, (4) viable timing and sequencing of projects, (4) detailed formulation of generation expansion options and performance, (5) transmission limitations and generation location needs, (6) expected Energy Efficiency ("EE"), and (7) integration of renewable generation and renewable portfolio standard compliance. The assessment was done considering different materializations of uncertainties captured in Futures as well as considering important sensitivities.

58. PREPA's IRP modeled the financial constraints as identified in discussion with its financial advisors¹³ in terms of the access to capital by explicitly designing Future 1, 2 and 4 with limited access, and Future 3, which is an optimistic case assuming PREPA has more access to capital to bring gas to the South and North, as well as accelerate the new builds to achieve efficiency gains. However, having more access to capital does not automatically translate into a different cost of capital. In terms of the discount rate, PREPA used consistent discount rate

¹³ AlixPartners LLC that were supporting in parallel the formulation of the Business Plan and debt renegotiation.

across the three Portfolios and four Futures, which allows apple-to-apple comparison of the portfolio net present value (“NPV”) costs.

59. The implementation of Energy Efficiency in Puerto Rico is not as straightforward as in other jurisdictions in the continental US and the benefits of EE already may be in place (see Attachment C hereto). However, PREPA did evaluate how these supply side initiatives can be incorporated and how they modify decisions with respect of the supply side. The Base IRP was conservative in this respect and considered PREPA’s forecast of the government EE programs based on observations of its implementation. Being conservative is important in the context of “capacity contraction” problem centered on decisions of when to retire large amounts of generation (e.g., up to 900 MW at Aguirre or up to 820 MW at Costa Sur) and the new capacity to be added. In this complex situation, under-building can result in either not being able to retire the units, defeating the key objective of the plan, or face quality of service issues. The Supplemental IRP determined how the plan will adapt to an aggressive and sustained Energy Efficiency program or as discussed later, a combination of EE and economic contraction.

60. The Commission ordered PREPA in the Supplemental IRP to co-optimize the expected renewable energy load shape and demand response programs to assess the opportunities of highly cost effective commercial and industrial scale programs and consider alternative management options focusing on the residential sector. PREPA in the Supplemental IRP took the approach to identify the levels of demand response necessary to take advantage of the renewable energy that would otherwise be curtailed to form a view of the amount that would be available under full RPS compliance and its likelihood. PREPA did not seek the replacement of thermal generation by demand response for the following reasons:

- a. The new base thermal units (the H Class combined cycle) have a capacity factor well in excess of 45% and produce in average 1.6 gigawatt hours (“GWh”) per year. The average energy displaced by demand response from night to day use was 0.6 GWh per year and even the maximum obtained was 1.0 GWh corresponding to a highly unlikely 791 MW of demand response would be insufficient.
- b. The units in the North have much lower capacity factors, but they are required for system security and PREPA does not think that it would be prudent to propose a plan that risked system security on a program whose effectiveness needs to be assessed at this time.
- c. The cost of renewable projects are not yet sunk, thus, when assessing the value of reducing generation during the night peak and moving it to the day peak, we need to consider the cost of installing these renewable projects, in the same way that we need to consider the capital and fixed costs of the H Class generation.

61. With respect to storage options, PREPA informed the Commission, as part of Answer 17d in its October 10, 2015, responses to the Commission’s First Requirement of Information of September 24, 2015, that in the Renewable Resources Integration Study the storage options were assessed and it was found that, given the levels of energy shift required to manage curtailment and the current state of the Battery Energy Storage Systems (“BESS”) technology, this option was uneconomic. The Commission in its order of February 9, 2016, waived the requirement of its December 4, 2015, order of modeling storage. Finally in the

Technical Conference of April 6, 2016, PREPA and Siemens PTI indicated that storage will be considered in future IRPs as this technology is advancing rather rapidly.

62. PREPA demonstrated in its Base IRP that for full RPS compliance, the operational limitations of the large steam units at Aguirre and Costa Sur are the leading factor in limiting PREPA's ability to integrate renewable generation.¹⁴ Thus, for 100% compliance, it will be necessary to add flexibility to the system via new combined cycle plants and retire these steam units. The timing of the retirements, however, is conditioned by factors discussed earlier and includes capital availability and time required for project development. When formulating the Futures for analysis, PREPA could not set 100% compliance as the base case as the curtailment costs would be excessive. As was shown in the Supplemental IRP,¹⁵ if PREPA attempted 100% compliance without advancing the investment for added flexibility; the curtailment could reach 20% and have a potential yearly cost of over \$100 million. That is a clear indication of "excessive costs" as provided in Act 82-2010.¹⁶ In summary, as shown in the Supplemental IRP, to achieve 100% RPS compliance it would be necessary to install three large Combined Cycle plants (H Class) -- two at Aguirre and one at Costa Sur by 2021 -- and retire Costa Sur units 5 and 6. That case has important short term capital requirements beyond those that we should realistically consider.¹⁷

¹⁴ These units have limits in the number of starts per year and the minimum operating levels and forcing the units to operate beyond the limits evaluated would likely result in rapid deterioration of already ageing units.

¹⁵ See Section 8.8.1, Schedules and New Generation Resources.

¹⁶ See Section 2.12, 12 L.P.R.A. § 8133.

¹⁷ PREPA and Siemens PTI did evaluate 100% RPS compliance under other Portfolios, as there would be much worse results under Portfolio 1 that could not properly handle the reduced targets, and Portfolio 2 would produce very similar results as the replacement of some of the inflexible generation is the driving factor and the F-Class combined cycle units are as flexible as the H Class.

63. PREPA also notes that only one group of intervenors, the National group, presented an expert witness who was experienced with IRPs. National's IRP expert stated, at the May 13, 2016, Oral Argument, that PREPA's IRP is comprehensive, follows industry standards, uses objective factors, accomplishes the goals of integrated planning, is credible, and has no fatal flaws. National's expert stated that PREPA's IRP should be approved and why. National's expert also made the points, among others, that PREPA's IRP is not final, is flexible, and there are opportunities to adjust the IRP in the future.

64. See also Section VII(B), which contains significant additional discussion of the modeling and other work done on the IRP. That additional discussion is placed there, rather than here, because it relates in large part to the reliability (reserve) issues addressed in that subsection.

65. PREPA respectfully submits that facts do not support the Commission's finding that the work done by PREPA and Siemens PTI, including the consideration of the Leidos work and Strategist results, the use of PROMOD, and other financial modeling, and PREPA's reliance on expert opinion and professional judgment violates the Commission's IRP Rule (or IRP practices) by not making further use of a capacity expansion model beyond the use that did occur.

66. See also Attachment D hereto, which provides further detail and support.

c. The Constraints on Modeling in this Case

67. The Final Order's reliance on the capacity expansion model point also is unwarranted because it fails to recognize adequately the timing, legal, and other major constraints under which the IRP was prepared, and how this bears on the role of expertise here.

68. Any additional use of a capacity expansion model here, beyond that by Leidos, which was reviewed, would have had to be very deeply constrained if it were to model anything close to PREPA's actual circumstances. See Section III(B)(1)(a) and (b), above.

69. The breadth and depth of the constraints mean that the IRP necessarily involved extensive expert opinion and judgments, which Siemens PTI supplied, and not just software runs. The Final Order seems simply to reject the premise that the role of Siemens PTI's expertise was appropriate in this instance (*see, e.g.*, Final Order, p. 26), but the use of expertise here was proper, as discussed above and also as confirmed by National's IRP expert.

70. See also Attachment D hereto, referenced above, which provides further detail and support.

71. There is nothing in the Final Order that would support the conclusion that, in these circumstances, the absence of additional use of a capacity expansion model, beyond what occurred, means that the work done is insufficient to support PREPA's IRP. This is not a case where further use of other software was a necessity in order for experts to make reliable recommendations or reach decisions.

d. The Deficiency Orders and Other Communications

72. The Commission's IRP rule, Regulation No. 8594, contains several provisions regarding use of a capacity expansion model. *See* Reg. No. 8594, §§ 1.08(b)(4), 2.03(b)(11), 2.04(B)(2).

73. However, the Commission's deficiency Order of August 3, 2015, did not explicitly state that the original IRP was deficient for failure to employ (further) a capacity expansion model. The Order's section regarding Vol. 1, item (5), states: "Regarding pages 6-2 through 6-9, PREPA shall explain, in detail, the process that was used to determine the appropriate resource and years to replace or repower existing units, add additional units, or retire various units. It shall further specify if PREPA and/or Siemens used a capacity expansion model, a capacity balance spreadsheet, expert opinion, or any other method to determine the appropriate resource and years."

74. Similarly, the Commission's second deficiency Order of December 4, 2015, also does not expressly state that PREPA was required to use (further) a capacity expansion model.

75. The Commission's official Minutes of the Clarification meeting of December 22, 2015, speak for themselves. The Minutes do not show a directive to use (further) such a model. Rather, what PREPA and Siemens PTI understood from the meeting was that the Commission likely would order use of a capacity expansion model in future IRP cycles. PREPA did not understand there to be any indication that not using (further) such a model in the current IRP cycle would mean approval would not be given. Otherwise, PREPA would have provided more detailed explanations on how the results of the First Stage IRP were used in the formulation of Portfolios and how these findings were reflected in the IRP reports when PREPA presented the concept of "firm reserves" and the results.¹⁸

76. PREPA had similar understandings based on the April 6, 2016, Technical Conference and the May 13, 2016, Oral Argument.

77. The document "Best Practices in Electric Utility Integrated Resource Planning from Synapse Energy Economics (June 2013), contains statements favoring use of a capacity expansion (resource optimization) model, but it does not state that use of such a model as opposed to other approaches invariably is required in all situations. For example, in its case study of an Arizona Public Service IRP, it states that APS did an "admirable job" (page 18) although there were several areas in which it could improve, the second of which was use of Strategist or another resource optimization model (p. 19). In the general recommendations section, page 31 states in part: "There are various reasonable ways to model plans, generally

¹⁸ The results of the various portfolios with respect of Firm Capacity and Reserves were presented in the Base IRP, Vol. 1: Supply Portfolios and Futures Analysis; see Sections 8.2.1, 8.2.2, and 8.2.3.

requiring the use of optimization or simulation models. Common models used throughout the industry include Strategist, EGEAS, System Optimizer, MIDAS, AURORA, PROMOD, and Market Analytics. These models are supplied to utilities by various third-party vendors.”

2. Fuel Forecasts and The Final Order’s Own Findings on AOGP’s Economics

78. As noted earlier, the Final Order listed “unreliable fuel forecasts” as its first “main reason” for not fully approving AOGP and the conversions. Final Order, p. 77.

79. The Final Order also itself reflects, however, that there is substantial evidence that AOGP provides economic benefits and savings on a wide range of fuel price scenarios. The Order recognizes that under the first stage IRP developed by Leidos and reflecting its use of Strategist, the implied value of AOGP is approximately \$5.5 billion. Final Order, p. 41. The Order also recognizes that in the Base IRP, the benefit of AOGP was \$2.5 billion, primarily due to falling fuel prices. *Id.* The Order also states that in the Supplemental IRP, the benefit was \$200 million, using different fuel price sensitivities. *Id.* The Order characterizes that range of results as a “repeated drop” that made the economic support for AOGP insufficiently reliable for full approval at this time. *Id.* PREPA respectfully submits that that reasoning has it backwards. AOGP has been shown to provide economic benefits and savings across a wide range of fuel prices. Even in the scenario with the lowest set of prices for the different fuels considered in the Supplemental IRP, AOGP is clearly shown to be cost effective. Moreover there is a large risk in not building AOGP, as the economic costs may be very substantial if prices were to recover as forecasted by PREPA and the Energy Information Administration (“EIA”) Reference Case (EIA Annual Energy Outlook 2016, Figure IF4-6).¹⁹

¹⁹ The EIA Annual Energy Outlook 2016 may be found at [https://www.eia.gov/forecasts/aeo/pdf/0383\(2016\).pdf](https://www.eia.gov/forecasts/aeo/pdf/0383(2016).pdf).

80. The Final Order suggests that perhaps PREPA could negotiate with EcoEléctrica to achieve natural gas price reductions attributable to AOGP and that “[a]bout that possibility, PREPA said nothing.” Final Order, p. 6. The Order also raises the hypothetical possibilities of expanding EcoEléctrica and of a pipeline from Costa Sur to Aguirre. *Id.*, p. 71. PREPA respectfully submits that the Order, in those respects, engages in speculation, is unsound, and ignores available information, including historical experience. As was discussed in the Base IRP, EcoEléctrica’s pricing appears to be linked to PREPA’s avoided prices. Base IRP, Vol. 1, p. 6-2. As the Base IRP explains, with AOGP, competition should force natural gas prices to converge. *Id.* The Order does not identify any factor that, absent AOGP, would cause EcoEléctrica to reduce prices to equal the savings that would be the result of AOGP. PREPA currently knows of none. In fact, in lack of AOGP, PREPA’s avoided costs will be linked to the light fuel oil.

81. Moreover, the Order does not factor in the limits on the ability to move natural gas from EcoEléctrica to other parts of the Island. PREPA has explained, at the April 6, 2016, Technical Conference, for example, that the pipeline idea already has been tried without success, and that it is not an available alternative. During the Technical Conference, PREPA explained that it is the Commonwealth’s Public Policy that construction of natural gas pipelines is not allowed in Puerto Rico. The Final Order overlooks the facts that two natural gas pipeline projects (Gasoducto del Sur and Vía Verde) were evaluated and implemented by PREPA in the past, and both were canceled in 2009 and 2012, respectively, due to strong public opposition and as mandated by the then Governor of Puerto Rico. The Gasoducto del Sur project precisely consisted of a pipeline to supply gas from EcoEléctrica to the Aguirre Power Complex (the one as to which the Order suggests there should have been further analysis). All of this also was

explained by PREPA during the IRP proceedings. Therefore, any expansion of the EcoEléctrica gas terminal will only serve the purpose of increasing the natural gas supply capacity for the Costa Sur generating units, but not to the Aguirre Power Complex, because no pipelines construction is allowed under the current *de facto* public policy. Hence, the only remaining feasible alternative to supply gas to the Aguirre Power Complex is the construction of AOGP.

82. The Final Order also indicates that the Supplemental IRP included natural gas prices and oil prices that are lower than those of other forecasts. Final Order, pp. 41-43. As part of the Answer to Question 1(c) in the Information Submission and Answers submitted by PREPA on March 21, 2016, in response to the Fourth Request of Information of the Commission issued on February 29, 2016, PREPA presented the results of a forecast exercise for a “Low Oil Price” scenario that considered the downturn of the oil and other fuel prices in the second half of year 2015. On April 12, 2016, the Commission issued a Resolution and Order requesting PREPA to perform additional portfolio runs that considered the revised fuel price forecast. No explanation about the forecast or its methodology was requested. The methodology used to develop PREPA’s Updated Fuel IRP is discussed in Attachment E hereto. The price forecast submitted as Updated Fuel IRP represents not the expected (most likely) but a lowest set of prices for the different fuels. However, there is no indication in the Order that that would support the conclusion that AOGP will not be economic. It is expected that the calculated benefits of the Updated Fuel IRP are the lowest possible and future materialization will represent higher benefits. Higher oil prices would only increase the value of AOGP, as illustrated by the Leidos savings figure.

83. The Final Order indicates that fuel forecast deviated substantially and without explanation from widely-used forecasts. Forecasted natural gas prices were found to be low.

However, the results of the forecasts were compared to the different cases presented in the EIA's Annual Energy Outlook 2015²⁰ and were found to be consistent. Attachment F shows a comparison of the fuel forecast with respect of the AEO 2015 and the recently published AEO 2016. It demonstrates that the forecast in the Base IRP are well within EIA forecasts (Reference and High Oil and Resource Technology case), that the AEO 2016 confirms our projections of spread between the light fuel oil (Fuel Oil #2) and natural gas (Henry Hub), which is the main driver or the differences in dispatch in Puerto Rico with MATS compliance technologies and the economies of the AOGP. In other words that we are making reasonable assumptions with respect of future evolution of gas and light fuel oil prices.

84. While we recognize that in the Base IRP, due to time limitations, we did not consider the impact of lower fuel prices, this was corrected in the Supplemental IRP where we assessed the impact of substantially lower prices. Note that this case was created to produce a pessimistic forecast that would help assess the impact of low prices. Moreover as shown in Attachment F our Natural Gas forecast very closely matches the recently published AEO 2016 "High Oil and Gas Technology Case" up to 2029, when the EIA forecasts drops lower.

3. Permitting Uncertainty

85. As noted earlier, the Final Order listed its final "main reason" for not fully approving AOGP as "permitting uncertainty". Final Order, p. 77-78.

86. Permitting uncertainty is not a reason to withhold full approval of AOGP. Any such uncertainty is not an issue on the merits of AOGP. Moreover, the Final Order only contributes to any such uncertainty by directing the pursuit of inconsistent permits (see Section II, above) and by not fully approving AOGP and the conversions. The Order's reasoning

²⁰ The EIA Annual Energy Outlook 2016 may be found at [https://www.eia.gov/forecasts/aeo/pdf/0383\(2015\).pdf](https://www.eia.gov/forecasts/aeo/pdf/0383(2015).pdf).

here is circular in nature. The Order does not give full approval because another agency might not issue an approval.

87. The initial schedule for most major infrastructure project's permitting processes is subject to changes due to unforeseeable causes or out of the proponent's control. AOGP is not an exception. Similar liquefied natural gas ("LNG") terminal projects have gone through like delays. That is to be expected because so many different regulatory agencies have jurisdiction over this type of projects, some with conflicting ministerial duties. Another reason for such delays could be legal challenges presented by intervenors or third parties. Although AOGP has gone through these kinds of delays, its permitting process has continued to advance, and still represents the fastest pathway to achieve MATS compliance. In regards to permitting, PREPA has made significant headway. See Attachment G - AOGP Permitting Activities Progress Report. Any alternative infrastructure project seeking to increase natural gas consumption would be required to initiate a lengthy permitting process, placing such development on a date well beyond that of AOGP when it comes to construction and operation.

88. At the present, the final permits for AOGP await the completion of the formal consultation under Section 7 of the federal Endangered Species Act, 16 U.S.C. § 1536. FERC has issued an FEIS for AOGP, as noted above, which was prepared with several other regulatory agencies (including OGPe) as cooperating agencies in the process. Most of the permit applications have been submitted to the regulatory agencies with jurisdiction over the project. The final stages of the permitting process entail a formal consultation by the National Marine Fisheries Service ("NMFS") under Section 7 of the Endangered Species Act. The formal consultation has also advanced since the NMFS deemed the Biological Assessment issued by FERC as complete, thus beginning the statutory terms to issue the Biological Opinion that will

complete the consultation. The NMFS is an agency under the National Oceanic and Atmospheric Administration (NOAA). On October 13, 2016, PREPA received information that NOAA headquarters that NMFS will conclude the formal consultation by Oct 14, 2016 and that it is on schedule to finish and release the Biological Opinion around December 1. PREPA has received no additional data requests and therefore, presumes that NMFS is satisfied with the Biological Assessment presented by FERC. Once this consultation is complete, the US Army Corps of Engineers will be able to complete the evaluation of the Joint Permit application and could issue the remaining federal permit needed for FERC's notice to proceed. Commonwealth permits are also under evaluation and could be issued at any time. If the Commission finally decides, however, to approve the construction of a large new CC unit and the repowering of the CC units in Aguirre, it will cause a negative impact in PREPA's efforts to comply with MATS because it will be required to initiate a whole new licensing process. This option will delay PREPA's MATS compliance by approximately 3-4 additional years in comparison to the alternative of completing the current AOGP permitting and construction process. The most recent schedule for AOGP, considering the latest developments in the permitting process, foresees that the project will be operational by July 2018, while the Aguirre projects according to the Order's Modified IRP would be operational between 2022 and 2023.

4. The Final Order's Other Points

89. The Final Order also includes various other findings regarding the sufficiency of the IRP and PREPA's compliance. *See also* Section VII(D), below. However, those findings do not warrant less than full approval of AOGP and the conversions. AOGP and the conversions need to be approved as part of PREPA's MATS compliance efforts. The Final Order's three main reasons for not fully approving AOGP and the conversions have been discussed above. In fact, the findings on the economics of AOGP support full approval. There is nothing else in the

Commission's expressed concerns on compliance that warrants anything less than full approval of AOGP and the conversions.

90. The Final Order also notes a potential concern about water usage or contamination in relation to AOGP. *E.g.*, Final Order, pp. 16, 57. During the April 6, 2016, Technical Conference, and during the IRP public hearings, PREPA clarified this issue, which was raised by the "ELAC" group of intervenors. PREPA clarified that the Puerto Rico Department of Natural Resources and Environment ("DNER") study demonstrates that residential and commercial use, along with agricultural use, have the greatest impact on the Southern Aquifer. Industrial use has the least impact. Also, the Order refers to ELAC's untrue claim that the cooling water used in the condensers is discharged to the aquifer, "contaminating important sources that serve many citizens". *See* Final Order, p. 16. The seawater used to cool steam in the condensers is supplied from the Jobos Bay to each unit, which discharges the warmer water back to the same bay, and never to the aquifer. The seawater extraction is regulated through permits issued and regulated by the DNER and the discharge water temperatures by PREQB and US EPA.

C. Conclusion

91. For the reasons discussed and referenced in this Section III and in Section II, above, and Section VII(A) through (D), below, the Final Order's rulings on this subject (and its related findings and conclusions) should be reconsidered. The Commission should issue a revised or amendatory Order that approves AOGP and the natural gas conversions of existing Aguirre thermal and CC units (and that removes the directives discussed in Section II, above).²¹

²¹ Without waiving its requests for reconsideration on this subject, PREPA notes that the Final Order's discussion of its rulings on this subject is incomplete in two spots. Assuming that the Commission were not to change the rulings,

IV. THE COMMISSION SHOULD MODIFY AND CLARIFY THE RULINGS RELATING TO NEW GENERATION AT PALO SECO

A. The Limit to Constructing One Unit Should Be Modified

92. The Final Order rules that PREPA should proceed with permitting for three small generation units at Palo Seco, but should proceed with constructing only one unit, and that the new unit should be a dual fuel capable CC unit under 100 megawatts (“MW”) in capacity. Final Order, pp. 3, 51, 67, 80, 86, 89, 96.

93. The direction to construct only one unit appears to misunderstand PREPA’s proposal and the underlying analysis in the Supplemental IRP, and the direction is premature and impractical and will cause unnecessary increases in development, generation, and transmission costs, reliability issues, and a potential delay in MATS compliance.

- a. PREPA’s Supplemental IRP used one unit for certain modeling purposes, but PREPA’s strategy was to move ahead with all three units and then, at the time when the technical permitting studies allow for filing permit application for construction of new emission units at Palo Seco, and considering the system load demand, make the decision whether to procure and build one, two, or three units. Thus, if demand does not drop as forecasted per the Commission’s instructions in the Supplemental IRP, due to for example a combination of economic recovery and lesser reductions due to Energy Efficiency, PREPA could continue with the detailed engineering, permitting, and construction of the number of units

those omissions should be fixed. First, the order, in the summary on page 2, mistakenly refers only to permitting of the conversions. Page 2 should refer to permitting, engineering, and planning of the conversions, to be consistent with the full discussion on page 79. Second, Part VII of the order, on page 84 and in the table on page 89, mistakenly does not explicitly include the ruling on the conversions from page 79.

required (one, two or three) to ensure secure operation of the electric grid. The Supplemental IRP and discussion at the April 6, 2016, Technical Conference addresses the above.

- b. Directing PREPA to build only one unit will negatively affect planning and negotiation with potential contractors. Also, if the low demand forecast that the Commission directed to be used in the Supplemental IRP does not materialize, the electrical system's reliability and safety would be impaired.
- c. That approach is impractical from the perspective of negotiating with contractors and will result in loading onto the single unit common costs of the engineering and planning stages that should be spread over multiple units at the site. Moreover, if additional units are needed, development costs unnecessarily will be repeated.
- d. To achieve this reduction of generation in the North (i.e., construction of only one small CC unit in Palo Seco), it was determined in the Supplemental IRP that new transmission reinforcements and investments would be required, in addition to the ones determined in the Base IRP's Transmission Study. The additional transmission investments are currently estimated at \$150 million. Furthermore, the scheduling efforts identified a minimum delay of two years to the transmission timeline and schedule to complete the required transmission investments. In other words, the construction of only one small CC unit in Palo Seco increases the required transmission investments by approximately 50% (from

approximately \$300 million to an estimate of \$450 million) and PREPA's updated schedule identified an important delay in the estimated completion date of the transmission projects (from FY 2020-21 to FY 2022-23 or later).

- e. The additional transmission requirements have the potential of significantly delaying MATS compliance in the North. Even with the construction of only one small combined cycle in Palo Seco on-line by 2020-21, the non-compliant generating units in Palo Seco and San Juan would not be able to be retired or declared limited use until the transmission projects are completed beyond 2022.
- f. It is also very important to emphasize that the transmission plan and topology formulated in the Supplemental IRP (Transmission Analysis, pp. 6-1 to 6-2), to address the reduction of generation in the North only by installing one small combined cycle in Palo Seco, increases the grid's vulnerability to atmospheric disturbances, natural disasters, sabotage attacks and multiple contingency system events with the potential of electrically separating the major load centers located in the North from the generation facilities of the South. Those situations could result in system blackouts and outages, as well as prolonged service interruptions to thousands of industrial, commercial and residential clients and critical loads throughout Puerto Rico.

94. The Final Order should be modified accordingly to allow proceeding with three units at this time, with the decision whether to procure and construct one, two, or three units to

be made at the time when the technical permitting studies allow for filing permit application for construction of new emission units at Palo Seco, alongside with system load demand monitoring. PREPA will act in collaboration with the Commission at that time.

B. The Order Should Be Clarified to Confirm that It Did Not Mandate a Particular Configuration

95. PREPA understands that the Final Order did not specify a particular configuration for the new unit(s) at Palo Seco. *See* Final Order, p. 51, fn. 173, and p. 67, fn. 224.

96. As stated in Section 2.2.3 of Vol. 1 of the Base IRP, the CC selections are representative of each particular technology class and do not represent final recommendations of a particular equipment or supplier. Hence, the exact sizing, configuration, and performance specification will be optimized as a result of the technical and economic feasibility studies required for the Palo Seco site.

97. Several arrangements or configurations of small and flexible combined cycles are available in the industry, and as technology progresses such arrangements can be designed to provide equally acceptable flexibility with the potential to achieve better thermal efficiency, reduce capital investment, as well as decreasing operation and maintenance costs.

98. Accordingly, the Final Order should be clarified to so that PREPA has the flexibility to make a prudent decision on the design configuration.

V. THE ORDER SHOULD GIVE PREPA FLEXIBILITY ON THE TIMING OF THE RETIREMENTS OF PALO SECO 1 AND 2, COSTA SUR 3 AND 4, AND SAN JUAN 7 AND 8, AND OF THE “LIMITED USE” DESIGNATION OF SAN JUAN 9 AND 10

A. The Retirements

99. The Final Order directs PREPA to begin the retirements of Palo Seco 1 and 2, Costa Sur 3 and 4, and San Juan 7 and 8 “as soon as feasible” and to complete the retirements by December 31, 2020. Final Order, pp. 3, 80-81, 86, 89, 94, 96.

100. PREPA proposed and agrees with the retirements, but PREPA needs to operate its system in a prudent manner. The San Juan 7 and 8 and Palo Seco 1 and 2 units cannot be retired until new generation is installed at the North and the transmission reinforcements and projects are completed. PREPA, in the exercise of good operations judgment, may or may not be able to comply with the above timing in a way that is compatible with reliability.

101. If only one small CC unit is installed in Palo Seco (see Section IV, above), the additional transmission projects required to address the reduction of generation in the North may delay by at least two years the estimated completion date of the transmission investments. In turn, that would delay MATS compliance in the North beyond 2022, even if a new small combined cycle would be installed and brought in service in Palo Seco by 2020-21.

102. Accordingly, the Final Order should be modified to indicate that the above schedule is a guideline, but that PREPA has the flexibility to manage the timing of the retirements in a prudent manner. If the Commission wishes to require annual year-end reporting on this subject, PREPA is amenable to providing such reports.

B. The “Limited Use” Designation

103. The Final Order requires PREPA to make a “limited use” designation under MATS as to San Juan 9 and 10, apparently in a prompt manner, and also imposes related notice and reporting requirements regarding exceedances. Final Order, pp. 81, 86, 89.

104. The San Juan 9 and 10 units cannot be designated limited use until new generation is installed at the North and the related transmission reinforcements and projects are completed.

105. Again, if only one small CC unit is installed in Palo Seco (see Section IV, above), the additional transmission projects required to address the reduction of generation in the North may delay by at least two years the estimated completion date of the transmission investments. In turn, that would delay MATS compliance in the North beyond 2022, even if a new small combined cycle would be installed and brought in service in Palo Seco by 2020-21.

106. Accordingly, the Final Order should be revised to give PREPA flexibility on when to make the limited use designations.

VI. OTHER REQUESTS FOR MODIFICATIONS

A. The Data and Records Collection and Retention Requirements

107. The Final Order imposes certain immediate data collection and retention requirements, listing 10 specific categories of data. Final Order, pp. 3, 90, 92-93, 96.

108. The Final Order also requires a plan for internal improvements by December 22, 2016, that includes, among other things, other records collection and retention requirements (for “vital communications, memoranda, white papers and contracts”) and “clear lines of control and authorship to all data and analyses”. Final Order, pp. 3, 91.

109. PREPA generally is in accord with the direction of these rulings, but requests the following modifications on practical grounds.

- a. The following data simply is not available and should be removed from the list: hourly consumption per customer class, monthly peak demand per customer class, and customers by class affected by feeder interruptions (the total estimated customers are available, but not by customer class).
- b. PREPA proposes that the data collection and retention requirements, rather than being imposed immediately, be added to the subjects of the plan to be submitted by December 22, 2016. This modification will avert PREPA having to do immediate investigation and information technology work on the list of data items. This modification also will allow a better coordinated retention and collection policy.

110. Accordingly, the Final Order should be modified as indicated above.

B. Renewables Contracts and the Renewables Independent Audit

111. The Final Order contains directives to PREPA regarding (1) seeking to renegotiate or exit existing renewables contracts that are not cost-effective or not likely to reach completion, to the extent lawful; (2) which process shall include an independent audit of the contracts for renewables that are not yet operational; and (3) starting a new renewables competitive bidding process by June 30, 2017, and related reporting requirements. Final Order, pp. 3, 82, 87-88, 89.

112. PREPA requests that, for practical as well as legal reasons, the directives be revised to afford PREPA more flexibility and to remove the requirement for selection of an independent auditor and the deadline for competitive bidding.

113. PREPA currently has 1,568 MW of capacity under 60 renewable energy project power purchase and operating agreements (“PPOAs”). Of these 5 have achieved commercial operation (163.1 MW), 3 are in pre-operation and selling energy to PREPA (57.4 MW), and 3 are in an advanced state of construction (52.4 MW). That is within the 580 MW integration capacity of the system identified in the Renewable Generation Integration Study that considered a peak demand of 3,300 MW and 64 MW of distributed generation projects. However, as of October 2016, distributed generation projects total over 115 MW and the demand is slightly over 3,000 MW..

114. PREPA conducted extensive renegotiations of many PPOAs in 2014, resulting in successful renegotiation of 18 PPOAs of approximately 600 MW in the aggregate. 2 of the 18 are interconnected and in pre-operation, and 2 are in advanced development. PREPA is considering extending milestones of 12 of the other 14.

115. Any efforts at further renegotiations or exiting contracts must take into account a number of factors, including how much can safely be interconnected, the experience of the 2014 renegotiations, specifics in the individual PPOAs, and the PPOAs’ dispute resolution processes, which can lead to costly and time-consuming litigation or arbitrations.

116. The competitive bidding process should not start until after PREPA has completed its evaluation of the above contracts. PREPA needs to have a clear understanding of its interconnection limits. To proceed without that could lead to lawsuits and arbitrations from parties under existing PPOAs, and from new ones if interconnection proved infeasible.

117. PREPA is amenable to giving the Commission reports on its progress every 6 months, starting March 31, 2017.

118. See also Attachment G hereto, which provides further detail and support.

119. Accordingly, the Final Order should be modified as indicated above, including but not limited to providing that a competitive bidding process be only started after PREPA has completed the evaluation of the existing contracts required by the Order in the context of the electric system limits and capability to integrate renewables.

C. The Timing of Reports on Environmental Subjects

120. The Final Order contains multiple directives regarding reporting on environmental subjects, but the directives are overlapping at least in part and contain a contradiction on timing. The Order directs submission of a report on environmental compliance litigation and risks on June 30, 2017, and every six months thereafter. The Order also direct a report on the status of “discussions with EPA with regard to MATS compliance and any other pending environmental litigation” on December 31, 2016, and then in one spot states succeeding reports are due every six months thereafter but in another spot states every three months thereafter. Final Order, pp. 17, 84, 86, 88, 89.

121. PREPA proposes that the reports be combined, that the first report be due December 31, 2016, and that the subsequent reports be due every six months thereafter. That would facilitate and reduce the burdens of PREPA’s preparing such reports while still providing timely reporting. Otherwise, this general subject would be subject to two streams of reports, on inconsistent schedules.

122. Accordingly, the Final Order should be modified as indicated above.

VII. OTHER FINDINGS THAT SHOULD BE CORRECTED OR MODIFIED

A. PREPA’s Demand (Load) Forecasts

123. The Final Order discusses PREPA’s demand (load) forecasts in a number of spots. The Order, in brief, finds the demand forecasts information to be insufficient in certain

respects, including not using a broader range of forecasts and also implying that PREPA should have forecast lower levels of demand despite the fact that the Supplemental IRP used a very low level of demand that the Commission specified. *See, e.g.*, Final Order, p. 65. The discussion of the demand forecasts should be revised, for many reasons.

124. To begin with, as background, Volume III of the Base IRP is “Demand and Fuel Forecasts and Demand Side Management”. Section 1 discusses the Demand Forecast and Appendices A, B, and C support various aspects of that discussion.

125. The subjects of the demand forecasts used in the IRP, the underlying work by PREPA and Siemens PTI, and updated demand data that indicate the reliability of the forecasts were discussed in detail at the April 6, 2016, Technical Conference, especially by by Ms. Joseline N. Estrada Rivera, Projections and Statistics Department Manager at PREPA and supported by Dr. Nelson Bacalao of Siemens PTI.

- a. The Commission’s advisors correctly noted that the Base IRP contains both base and updated forecasts prepared by PREPA.
- b. Dr. Bacalao explained that Siemens PTI prepared its own independent forecasts and then compared them to the forecasts from PREPA. Siemens PTI found that the PREPA information was in the middle and Siemens recommended to use the PREPA information.
- c. The Commission’s advisors then asked how the forecasts were developed.
- d. Ms. Estrada responded in detail. In brief, PREPA uses econometric modeling, and she discussed in detail the data and methods used by PREPA.

- e. The Commission's advisors indicated that the Commission might ask for written documentation on this subject, but PREPA subsequently did not receive such a request. However, on March 21, 2016, PREPA provided the attachment PREPA IRP Methodology Forecast.pdf, where the demand forecast methodology was explained, as part of the Information Submission and Answers to the February 29, 2016, Supplementary Interrogatory and Request for Information of Instituto de Competitividad y Sostenibilidad Económica de Puerto Rico.
- f. The Commission's advisors also asked Ms. Estrada if she considered the forecast information still to be sound.
- g. Ms. Estrada again responded in detail and she also provided updated information. Among other things, she explained that, as of January 2016, actual demand was running about 1% above the projections.

PREPA respectfully submits that the information discussed at the Technical Conference essentially does not appear to have been taken into account in the Final Order.

126. PREPA also notes that the Supplemental IRP uses a very low level of demand directed by the Commission that hypothesizes sharp reductions due to energy efficiency. The Commission directed that that level be used even though high fuel and purchased power costs for many years already gave PREPA's customers large incentives for energy efficiency as well as conservation. See Attachment C hereto, referenced earlier.

127. While some intervenors argued that PREPA's forecasts did not sufficiently take into account factors that might reduce demand, none of them presented any actual forecasts to support their claims.

128. Given the very low level of demand assumed in the Supplemental IRP, it is not very plausible that demand would be so much even lower that it would actually affect the resource selections in the Supplemental IRP.

129. The Base IRP and the Supplemental IRP provide a great deal of flexibility in the event that demand declines. Moreover, the Action Plan is for the next five years, and within that period there will be another IRP cycle, per Section 6B(h) of Act 83-1941 as added by Act 57-2014 and as amended by Act 4-2016. Section 6B(h) also provides for an even sooner IRP review if there is a major change in demand.

130. See also Attachment I hereto, a report prepared by PREPA which provides further detail and support on this subject, including additional updated information.

131. Accordingly, the Final Order should be modified to withdraw its findings of insufficiency on the subject of the demand forecasts. The Commission should substitute findings reflecting the sufficiency of the information as well as the information from the updates, and also to state that, especially given the Supplemental IRP and the flexibility of PREPA's proposals, including the process proposed as to adding units at Palo Seco, that this subject does not warrant any changes in PREPA's proposals.

B. PREPA's Reserve Margin

132. The Final Order discusses PREPA's reserve margin on pages 20-22, 35-37, 67. The Order, in brief, suggests that PREPA's use of a Loss of Load Hours ("LOLH") approach to the reserve margin, while not necessarily inappropriate, was not as transparent as some other approaches; that modeling of forced outages was not robust; that PREPA provided insufficient support for its metric; and raises whether it might be possible to use simple cycle turbines instead of CC for reserve margin purposes.

133. The Final Order's discussion of PREPA's reserve margin should be revised. PREPA supported its approach in the Base IRP and in its October 15, 2015, responses to the Commission's First Requirement of Information, ROIs 28 and 29.

134. The Final Order should allow the use of reliability criteria (Loss of Load Hours or "LOLH"). PREPA's reliability criteria of 4 LOLH relates directly with the level of service expected to be provided to customers. It is analogous to the Loss of Load Expectancy ("LOLE") used by independent system operators in the continental US, but significantly more relaxed due to the isolated nature of PREPA's system.²² The planning reserve margin on the other hand is a result providing the levels of excess capacity that need to be maintained to achieve the target quality of service (LOLH or LOLE) and it is a function of (1) the size of the largest units with respect of the system peak, (2) the availability of the existing units, (3) the load shape, and (4) interconnection with other utilities to share reserves. It is customary, once this reserve value is determined, to use it in the short term and update it periodically.²³ Given that the IRP was expected to radically change the composition of the generating fleet, it was necessary to start from a reliability criteria and then the First Stage IRP identified the levels of reserve required with modernized fleet (see Attachment D, referenced earlier, for details).

135. The modeling of the forced outages and its impact was first considered in the Strategist runs of the First Stage IRP and the associated levels of reserve and then confirmed with PROMOD runs that, by using a Hourly Monte Carlo with a technique called "intellidraw", ensures the expected number of forced outage hours equals the actual number of forced outage

²² Consider that if in a given year there are 4 Hours of loss of load with duration of 2 hours each, this would imply a LOLE of 2 days, which is significantly more relaxed than the US standard of LOLE of 1 day in 10 years.

²³ For instance the Mid Continent ISO (MISO) performs a LOLE study annually and uses it to set the minimum Planning Reserve Margin (PRM) for the upcoming planning year and provide a nine (9) year PRM forecast. (<https://www.misoenergy.org/Planning/ResourceAdequacy/Pages/ResourceAdequacyStudies.aspx>)

hours in the run. Given the random nature of the forced outage logic, that prevents the units from being out for very long intervals, but still maintains the random nature of forced outage (the outages can happen at any time/any length).

136. Contrary to the statements expressed in the Final Order, PREPA used a comprehensive approach in the formulation of Portfolios, considered a wide range of options, and PREPA did not leave “valid options unidentified”. In developing the Portfolios and its timing PREPA:

- a. Complemented the results of First Stage I IRP that recommended the H Class combined cycle and reciprocating engines as part of the solution, via an extensive screening of thermal generation options and based on this expanded the candidate technologies to include: (1) intermediate sized combined cycle units the F-Class, (2) small combined cycle units (SCC 800), and (3) simple cycle combustion engines (GT peakers),²⁴ in addition to the reciprocating engines.²⁵
- b. PREPA added the possibility of refurbishing the existing fleet to minimize capital expenditures while improving efficiency, which allow identification of the refurbishing of the Aguirre CC units.

137. The Final Order should recognize the role that: (1) a reliability criteria, (2) the complementarily roles of a capacity expansion model like Strategist and a detailed model like

²⁴ Contrary to the opinion expressed in the Final Order (at p. 25), PREPA modeled GT peakers. See, for example, Table 3-9 of Vol. 1 of the Base IRP that shows “GE LM6000 PG Sprint SC Operational Assumptions”. In fact, PREPA’s IRP investigated the option of installing peaking units (5 x LM6000) with a total capacity of 238 MW.

²⁵ Contrary to the opinions in the Final Order these engines are commonly used in utility applications, see as a reference the recently announced 250 MW power plant in Denton Texas using Wärtsilä 50SG power plant based on 18V50SG 18 MW engines (<http://www.wartsila.com/media/news/21-09-2016-wartsila-supplies-225-mw-power-plant-to-the-city-of-denton-texas-usa>).

PROMOD, and (3) the professional experience of experts play in the formulation of a realistic and implementable IRP and the adequacy of the overall process conducted by PREPA and detailed in Attachment D, referenced earlier. The Order should further recognize the efforts made in expanding the number of generation options considered that complemented the demand side resources discussed above.

138. Accordingly, the Final Order should be modified as indicated above.

C. Siemens PTI's Independence

139. The Final Order discusses the independence of Siemens PTI and, while not finding that the Siemens PTI was affected by any potential bias, nonetheless raises this subject. See Final Order, pp. 37-38.

140. The Final Order's discussion does not find any affects from perceived bias, and PREPA is confident there were none. Quite the opposite; the fact that PREPA and Puerto Rico's best interests was a guiding principle of Siemens PTI's work can be observed by the recommendations made that, contrary to the First Stage IRP that recommended the entire replacement of PREPA's fleet, in this case the repowering of the Aguirre CC 1 and 2 units that will be carried out by using different vendor's combustion turbines was recommended, the time of entry of new large generating plants was displaced, and a conscious effort to identify various suppliers for all the generation options evaluated was made. This subject also was discussed, and any inference of bias refuted, at the April 6, 2016, Technical Conference. Thus, the Order's discussion should be revised.

141. Accordingly, the Final Order should be modified as indicated above.

D. The IRP's Compliance

142. The Final Order finds that the IRP “technically” included the information required by Act 57-2014 and “nominally” complied with the statute, but that the IRP complied in part but not in full with the Commission’s IRP rule (Reg. No. 8594) and thus did not fulfill the objectives of the statute. *E.g.*, Final Order, p. 90.

143. The Final Order contains many findings regarding the IRP’s compliance with the IRP Rule (Reg. No. 8594), and other compliance with Commission directives or requests, often mixed in with findings that are not findings regarding compliance but of the degree or timeliness of compliance or the sufficiency of the data or analysis. *E.g.*, Final Order, pp. 4-7, 26, 31-63, 64-76, 82-93 (also including the Commission’s Modified IRP and directives regarding the next IRP cycle), 93-96.²⁶

- a. The Order concludes that the IRP complied in many respects with the IRP Rule but that overall it does not comply in full with the IRP Rule, as noted above. *E.g.*, Final Order, pp. 4, 7, 76.
- b. The Order emphasizes its points regarding what it finds to be non-use by PREPA of a capacity expansion model and overuse of professional judgments; the fuel forecast; the demand forecast; and reliability (the reserve margin). *E.g.*, Final Order, pp. 5, 6, 26, 34-35, 39, 40, 41, 41-42, 44-46, 65, 76.
- c. The Order also finds that PREPA’s financial constraints were not adequately modeled. Final Order, pp. 46-47.

²⁶ The Final Order does correctly find compliance by the IRP, PREPA, and Siemens PTI on many points, but in this Motion, the focus is on findings of non-compliance.

financial constraints, demand side resources, renewables, storage, and the renewable portfolio standard), and fuel price sensitivities in Section III(B)(1), (2), and (4), above. That discussion shows that findings of non-compliance in relation to those subjects are not warranted.

146. Please also note that PREPA already has addressed the subjects of the demand forecasts and reliability (the reserve margin) in Section VIII(A) and (B), above. That discussion shows that findings of non-compliance in relation to those subjects also are not warranted.

147. PREPA also respectfully disagrees with the discussion of delayed compliance, but does not believe that it would be productive to address those items on a line by line basis.

148. Accordingly, the Final Order should be modified consistent with Sections IIIA, (B)(1) and (2), D, and VII(A) and (B), as indicated above.

E. Puerto Rico's Wind Potential

149. The Final Order finds that the Base IRP, Vol. 1, at p. 4-3, identified local opposition as the reason more wind energy than that already accessed would be unavailable. Final Order, pp. 25, 94. That finding needs to be corrected.

150. The Base IRP expressly identified two reasons: "Note however that we did not include any wind turbine projects as the onshore potential is rather low and these types of plants are becoming increasingly difficult to site in the island due to local opposition." Base IRP, Vol. 1, p. 4-3. PREPA also discussed the limited potential during the April 6, 2016, Technical Conference.

151. The Energy Information Administration web site page on renewables in Puerto Rico states in part: "Multiple wind projects have been proposed, but Puerto Rico's onshore wind resource is limited, and proposed sites have faced substantial local opposition." (citing both PREPA's Base IRP and US DOE's own analysis). See these two web pages:

<http://www.eia.gov/state/analysis.cfm?sid=RQ>

http://apps2.eere.energy.gov/wind/windexchange/where_is_wind_pr_vi.asp

152. The findings on pages 25 and 94 of the Final Order should be corrected to reflect both grounds.

F. Appendix A: Timeline and History of the Proceeding

153. Appendix A to the Final Order is called: “TIMELINE AND HISTORY OF THE PROCEEDING”.

154. The Timeline is missing some important items:

- a. The Timeline is missing the Commission’s four sets of requirements of information issued to PREPA and PREPA’s responses.
- b. The Timeline is missing the Procedural Order of September 30, 2015, filed on October 1, 2015, scheduling the Technical Conference, etc.
- c. The Timeline is missing the Resolution and Order of October 23, 2015, postponing the Technical Conference, etc.

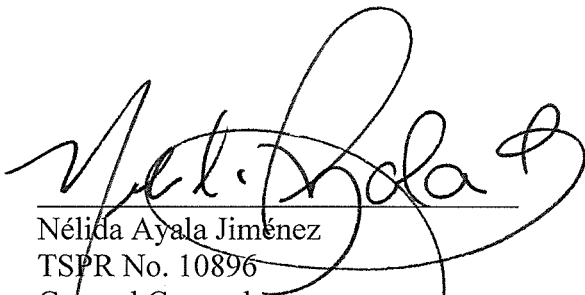
155. Those items should be included in the Timeline.

WHEREFORE, for all the reasons stated and referenced in this Motion and its Attachments and Verifications, and all reasons appearing in the record, PREPA respectfully requests that the Commission grant this Motion, conduct reconsideration, and issue a revised or amendatory Order granting the relief requested herein and all other such relief as is warranted.


RESPECTFULLY SUBMITTED,

IN SAN JUAN, PUERTO RICO, THIS 13TH DAY OF OCTOBER, 2016

PUERTO RICO ELECTRIC POWER AUTHORITY



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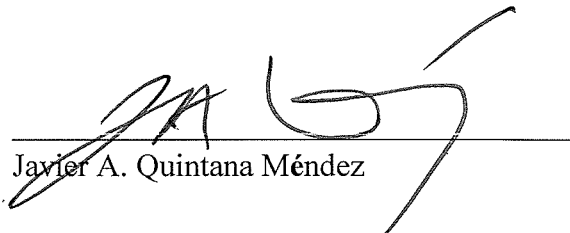
VERIFICATION

I, Javier A. Quintana Méndez, of legal age, engineer and executive, married, and resident of Guaynabo, Puerto Rico, in my capacity as Executive Director of the Puerto Rico Electric Power Authority ("PREPA"), under oath declare as follows:

1. My name and personal circumstances are those stated above.
2. I have reviewed the foregoing Motion ("PREPA's Motion").
3. In my capacity as Executive Director of the Puerto Rico Electric Power Authority, I have been duly authorized to provide this Verification in support of PREPA's Motion.
4. The information included in PREPA's Motion is true on the basis of my personal knowledge or on the basis of the information supplied to me by employees or advisors of PREPA, and, with respect to legal points, by counsel for PREPA.

RESPECTFULLY SUBMITTED.

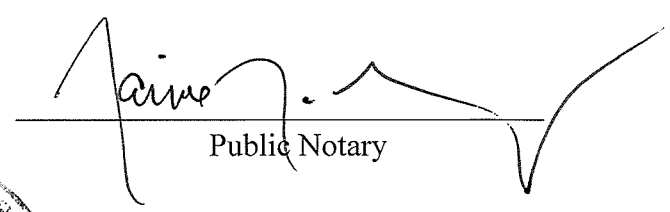
In San Juan, Puerto Rico, this 13 day of October, 2016.



Javier A. Quintana Méndez

Affidavit No. 3,645

Sworn and subscribed before me by Javier A. Quintana Méndez, of the personal circumstances above mentioned, whom I personally know, in San Juan, Puerto Rico, this 13 day of October, 2016.



Public Notary



EXENTO PAGO ARANCEL
LEY 47
4 DE JUNIO DE 1982

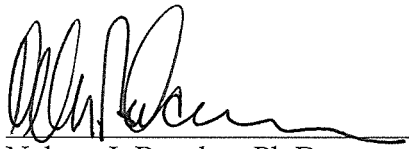
VERIFICATION

I, Nelson J. Bacalao, Ph.D., of legal age, engineer and executive, married, and resident of Houston, Texas, in my capacity as Senior Manager, Consulting, of Siemens Industry, Inc., under oath declare as follows:

1. My name and personal circumstances are those states above.
2. I have reviewed the foregoing Motion ("PREPA's Motion").
3. In my capacity as Senior Manager, Consulting, of Siemens Industry, Inc., I have been duly authorized to provide this Verification in support of PREPA's Motion.
4. The information included in PREPA's Motion regarding the integrated resource plans ("IRPs") prepared by Siemens and the other information in the Motion regarding Siemens, Siemens' work related to this matter, discovery answered by Siemens, and Siemens' statements at proceedings in this case, is true on the basis of my personal knowledge or on the basis of the information supplied to me by employees or advisors of PREPA or of Siemens.

RESPECTFULLY SUBMITTED.

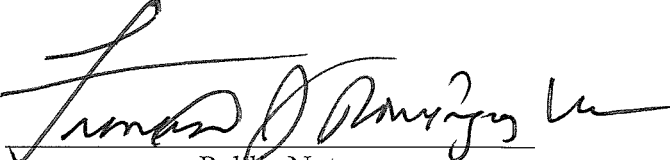
In San Juan, Puerto Rico, this 11th day of October, 2016.



Nelson J. Bacalao, Ph.D.

Affidavit No. 2386

Sworn and subscribed before me by Nelson J. Bacalao, Ph.D., of the personal circumstances above mentioned, whom I identified by his driver's license with signature and photo, issued by the State of Texas, United States of America, license number 16101472, in San Juan, Puerto Rico, this 11th day of October, 2016.



Public Notary

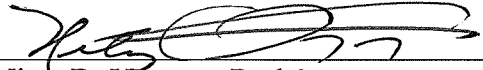
EXENTO PAGO ARANCEL
LEY 47
4 DE JUNIO DE 1982



CERTIFICATION OF SERVICE

I hereby certify that on October 13, 2016, I have sent the above Motion (including its attachments and verifications) to the Puerto Rico Energy Commission, through its General Legal Counsel, and to: acasellas@amgprlaw.com; agraitfe@agraitlawpr.com; agraitfe@gmail.com; agraitfe@caribe.net; ana.rodriguez@oneillborges.com; carlos.reyes@ecoelectrica.com; carlos.valldejuly@oneillborges.com; ccf@tcmrslaw.com; cfl@mcvpr.com; codiot@oipc.pr.gov; dortiz@elpuente.us; dperez@cabprlaw.com; edwin.quinones@aae.pr.gov; energiaverdepr@gmail.com; epo@amgprlaw.com; felipelozada1949@gmail.com; fermin.fontanes@oneillborges.com; fviejo@amgprlaw.com; hburgos@cabprlaw.com; icv@mcvpr.com; jose.maeso@aae.pr.gov; jperez@oipc.pr.gov; lga@elpuente.us; lionel.orama@upr.edu; lmateo@ferraiuoli.com; mgrpcorp@gmail.com; mrhernandez@fgirlaw.com; mgrpcorp@gmail.com; pnieves@fgirlaw.com; rstgo2@gmail.com; valvarados@gmail.com; victorluisgonzalez@yahoo.com.

I hereby certify that on October 13, 2016, I also have caused copies of the above Motion (including its attachments and verifications) to be deposited in the United States Mail addressed to the parties and persons identified on pages 99-101 of the Commission's Final Order (other than to PREPA). A copy of the relevant portions of those pages is attached hereto.



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Executive Advisor

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FROM PAGE 99 OF THE FINAL ORDER

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FROM PAGE 100 OF THE FINAL ORDER

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FROM PAGE 100 OF THE FINAL ORDER, CONTINUED

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FROM PAGE 101 OF THE FINAL ORDER

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Fiddler, González & Rodríguez, P.S.C.

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