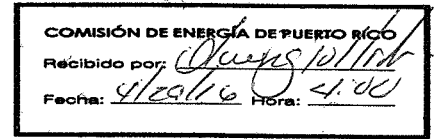


COMMONWEALTH OF PUERTO RICO  
PUERTO RICO ENERGY COMMISSION



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IN RE: INTEGRATED RESOURCE PLAN FOR : No. CEPR-AP-2015-0002  
THE PUERTO RICO ELECTRIC POWER AUTHORITY :  
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**BRIEF BY INTERVENORS NATIONAL AND ASSURED**

**TO THE HONORABLE ENERGY COMMISSION:**

COME NOW National Public Finance Guarantee Corp. (“National”), by its attorneys Adsuar Muñiz Goyco Seda & Pérez-Ochoa, P.S.C. and Weil, Gotshal & Manges LLP, and Assured Guaranty Corp. and Assured Guaranty Municipal Corp. (“Assured, and together with National, “Intervenors”), by their attorneys Casellas Alcover & Burgos, P.S.C. and Cadwalader, Wickersham & Taft LLP, and with the assistance of their technical advisors Black & Veatch, hereby respectfully submit their Brief to the Puerto Rico Energy Commission (“Energy Commission” or “Commission”) in compliance with the Order set forth in the Commission’s February 9, 2016 Resolution, as amended:<sup>1</sup>

**I. INTRODUCTION**

After a careful analysis of the documents and materials submitted by the Puerto Rico Electric Power Authority (“PREPA”) in conjunction with its proposed Integrated Resource Plan (the “Proposed IRP”) and PREPA’s presentation during the Technical Hearing, the position of Intervenors and their technical advisors is that the process followed by PREPA is consistent with the standard approach in the industry and reflects an understanding of the purpose of developing

<sup>1</sup> The Commission’s February 9, 2016 Resolution was further amended by the April 21, 2016 Resolution, which extended the deadline for submission of intervenors’ briefs to April 29, 2016.

an IRP. Act 57-2014, known as the Puerto Rico Energy Transformation and RELIEF Act (the “Energy Act” or “Act 57-2014”), as amended, requires the development of PREPA’s infrastructure through short-term and long-term planning. An integrated resource plan (“IRP”) is intended to do the latter. It is a long-term planning methodology that uses a comprehensive decision support tool to analyze options and develop a road map for providing reliable and least-cost electric service to customers while considering risks and uncertainties inherent in the electric utility business. That being the case, the Proposed IRP represents a credible analysis, with no fatal flaws.

## II. DISCUSSION AND ANALYSIS

### A. The IRP Process

The process employed by PREPA for the preparation of the Proposed IRP contains no fatal flaws.<sup>2</sup> PREPA gave importance to the requirement to be Mercury and Air Toxics Standards (“MATS”) compliant through the choice of new generation technologies. Best available technologies were assumed, including air-cooled condensers which will minimize the use of water and eliminate high-temperature water discharge. *See* Transcript from Recorded Audio Technical Hearing (“T.”) at 411-413. Consideration was given to the need for flexibility through the selection of relatively smaller, more operationally flexible generation technology. This helps to address both the uncertainty of demand growth as well as the future development of energy efficiency and demand response resources. The utilization of a wide range of supply-side technologies is appropriate within an IRP. While one can debate the appropriateness and accuracy of the various assumptions that have been made as inputs to the model, a critical

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<sup>2</sup> PREPA filed a Supplemental IRP on April 25, 2016 that analyzed sensitivities of reduced fuel price forecasts. A high level review of the findings seemed to indicate that the overall recommendations of the IRP did not change. However, National and Assured did not have sufficient time to adequately review this Supplemental IRP. Accordingly, National and Assured hereby reserve their right to submit additional comments or concerns to the Commission following a more thorough review of the Supplemental IRP.

consideration is to maintain internal consistency throughout the IRP and subject the analysis to consideration of various sensitivities and scenarios, all of which has been done within PREPA's IRP.

Furthermore, at the Technical Hearing, Dr. Nelson Bacalao ("Dr. Bacalao") explained that optimal capacity expansion simulations were performed in a previous study conducted by Leidos, to which Siemens had access. *See* T. 63:15-25, 64:1-22. The clarification of the process that Dr. Bacalao provided alleviates concerns previously expressed regarding PREPA not having performed such simulations as part of the IRP process.

A few other issues were discussed during the Technical Hearing relating to the IRP process. First, the question of plant ownership was raised. PREPA responded that the IRP is agnostic to ownership. *See* T. 249:16-25, 150:1-6. This is appropriate, as ownership is not a consideration for an IRP. An IRP should focus on resources specifically, and ownership issues are determined at a later date when decisions are made to build. Another issue raised was that of all-in levelized costs of electricity ("LCOE"). *See* Siemens Presentation at 9. It is important to note that these are for illustration only, and that capacity factors will differ across facilities. Ultimately, it is not the LCOE alone that matters, but also the dispatch profile of the units combined at their respective underlying LCOE. These dynamic factors are considered in the production cost analysis performed in the Proposed IRP and are what determines the comparative costs of the various portfolios under different futures reflected in the Proposed IRP.

Additionally, the specification of smaller type units, particularly in the north, is also an appropriate consideration, given the criticality of the load in the north, with limited generation in the north and reliance on the south-to-north transmission facilities.

Substantial criticism was voiced at the Technical Hearing of the specification of Siemens machines in the IRP, but this criticism reflects a lack of understanding of the IRP process. *See* T. 390-391. This is not a relevant concern in the development of an IRP. A proxy for the size/class of units is typically considered, as specific units are needed for modeling purposes. It is appropriate to select a manufacturer (in this case, Siemens) that offers generating units that are representative of a technology class for which information on costs and performance is readily available; doing so helps to ensure the internal consistency that is critical to the IRP process. During the implementation stage of the IRP, PREPA will have the opportunity (and should take advantage of the opportunity) to conduct a competitive bidding process with multiple manufacturers of comparable technologies (beyond Siemens) to determine the most economic, reliable, and commercially feasible generating units for PREPA.

Lastly, some parties raised the question of the IRP's impartiality and suggested it may have been influenced to serve creditors' needs. *See* T. 362:11-25, 363:1-15. PREPA properly rejected this unfounded accusation. *See* T. 363:16-25, 364:1-23. The IRP proposed by PREPA reflects a careful analysis of the various options available for Puerto Rico's electric system, based on robust assumptions and standard IRP methodology. PREPA's IRP is a balanced proposal that is supported by the evidence in the record.

B. Load forecasting and Management of Demand

A mixture of smaller and larger generation units, as put forth in the IRP, is appropriate to provide for the flexibility required to respond to demand behavior going forward. Flexibility of supply is important as Energy Efficiency and Demand Response resources become more widely utilized by PREPA customers. Larger-frame machines are less flexible and less able to provide

for the dynamic changes in demand that would be experienced with growing levels of demand response and energy efficiency.

While PREPA should continue to explore and invest in energy efficiency and customer-sited distributed generation, ultimately decisions to pursue such opportunities fall upon PREPA's customers, and given the projected magnitude of capacity requirements, PREPA does not expect that realistic achievements in this regard will significantly mitigate the near-term capacity requirements addressed in PREPA's IRP. The flexibility of the proposed future buildout represented in the Proposed IRP allows for adjustments to be made if PREPA finds itself in a position where achievements in load reductions due to energy efficiency or customers utilizing distributed generating resources reduce demand by significant amounts to alter the timing of capacity requirements.

Despite the commonly held view that PREPA can and should be doing more to incentivize customer penetration related to demand-side management ("DSM"), energy efficiency ("EE"), and demand response ("DR"), without a detailed analysis of PREPA's system, it is not possible to quantify the appropriate levels of demand and energy reductions that can be achieved through such mechanisms. The IRP proposed by PREPA lays the framework for a long-term expansion plan; as such, it requires some near-term commitments while providing flexibility for PREPA to change course before making commitments related to longer-term decisions. Subsequent IRPs can be adjusted in a manner that reflects increased levels of DSM/EE/DR in the event that an appropriate study has been performed to help quantify an economically achievable magnitude of DSM/EE/DR.

### C. Renewable Energy

PREPA has performed numerous studies to evaluate the appropriate level of renewables that should be considered in the IRP from a reliability perspective. Integration of renewables

into existing electric systems has implications on the electric grid which must be addressed. In PREPA's case, integrating an increased amount of renewable energy into its system is expected to present reliability and infrastructure concerns that will require further investment to address. Siemens provided an explanation of the curtailment that will result if full Renewable Portfolio Standard compliance is met. *See* Siemens Presentation at 11; T. 22. As new generation is added and the system becomes more flexible, curtailment would be expected to go down.

D. Fossil Resources

The Aguirre Offshore Gas Port ("AOGP") project is the best, credible option to bring additional natural gas supply to Puerto Rico, particularly considering that MATS requirements have already taken effect. AOGP represents a proven, viable technology that is highly feasible for the south coast of Puerto Rico. Of critical importance, the offshore vessel-to-vessel vaporization technology obviates the need to build a land-based cryogenic liquefied natural gas storage tank, which would be time-prohibitive. The specialized 9% nickel carbon alloy is not readily available and has a lead time of approximately forty-eight months.

Furthermore, during the Technical Hearing, Siemens explained that the current permitting limits (air permits) that apply to existing plants include the AOGP (*see* T. 321:14-25), and that new permits would be required for a new Aguirre generating plant. This is a reasonable approach as it represents the most expeditious way to permit the AOGP, as opposed to applying for new air permits for the site at the present time.

During the Technical Hearing, intervenor Enlace Latino de Acción Climática ("ELAC") expressed concerns related to public health. *See* T. 429:3-15. The expansion plans outlined in PREPA's IRP are compliant with existing and expected environmental regulations and

appropriately consider best available control technologies.<sup>3</sup> Based on the expansion plans outlined in the IRP, PREPA's improved generating unit portfolios will represent an improvement in terms of public health compared to the existing system. Lastly, aside from considerations relating to environmental regulations, public health issues are considered matters beyond the scope of a typical IRP.

E. Transmission and Reliability

In the context of an IRP, the ability or inability to obtain permits represents a reality that cannot be ignored or assumed away. PREPA has had considerable challenges in permitting transmission in Puerto Rico. An explanation of the process of obtaining tracts for transmission was also provided at the Technical Hearing, and the understanding is that the feasibility of obtaining a permit for increased transmission is low. Permitting challenges aside, ultimately, the IRP considers the economic and reliability tradeoff between transmission infrastructure improvements and new generation to alleviate transmission constraints. Further, siting additional generation on the south side of Puerto Rico and relying on transmission improvements to wheel power to the north side of Puerto Rico would create an increase in the contingency requirement. Nonetheless, in the end, the balance between transmission investment and generation siting and investment in the IRP is reasonable considering economics, permitting realities, and reliability.

**WHEREFORE**, Intervenors respectfully request that this Commission take into consideration the arguments and opinions set forth in this Brief when it issues a final decision on the IRP, as supplemented, presented by PREPA in this administrative proceeding.

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<sup>3</sup> The IRP's approach assumes that any new generation would be the best available technology by class, as required to meet the needs of the system. The best available technology is considered high-efficiency lower-emission technology, which, it is worth noting, would exceed the proposed future definition of Highly Efficient Generation contemplated by the Energy Commission.

**RESPECTFULLY SUBMITTED.**

In San Juan, Puerto Rico, this 29th of April, 2016.

**CERTIFICATE OF SERVICE:** We hereby certify that on this same date a true and accurate copy of the foregoing motion was sent to **Windmar Group** to Victor Luis González [victorluisgonzalez@yahoo.com](mailto:victorluisgonzalez@yahoo.com) and Fernando Agrait, Esq. to [agraitfe@gmail.com](mailto:agraitfe@gmail.com); **Romain & Associates, PSC** to Marc G. Romain Prieto, Esq. [mgrpcorp@gmail.com](mailto:mgrpcorp@gmail.com); **Autoridad de Energía Eléctrica de Puerto Rico** to Nélica Ayala Jiménez, Esq. [n-ayala@aepr.com](mailto:n-ayala@aepr.com) and Nitza D. Vázquez Rodríguez, Esq. to [n-vazquez@aepr.com](mailto:n-vazquez@aepr.com), **EcoEléctrica, LLP**, to Carlos A. Reyes, P.E. [carlos.reyes@ecoelectrica.com](mailto:carlos.reyes@ecoelectrica.com); **Toro, Colón, Mullet, Rivera & Sifre, PSC** to Carlos E. Colón Franseschi, Esq. [ccf@tcmrslaw.com](mailto:ccf@tcmrslaw.com); **Mesa de Diálogo Energético** to Felipe Lozada-Montañez [felipelozada1949@gmail.com](mailto:felipelozada1949@gmail.com), and Manuel Fernández Mejía to [manuelgabrielfernandez@gmail.com](mailto:manuelgabrielfernandez@gmail.com); **Enlace Latino de Acción Climática, El Puente de Williamsburg, Inc. and Comité Dialogo Ambiental, Inc.** to Ruth Santiago, Esq. [rstgo2@gmail.com](mailto:rstgo2@gmail.com); **Instituto Nacional de Energía y Sostenibilidad Isleña**, to Lionel R. Orama Exclusa, [lionel.orama@upr.edu](mailto:lionel.orama@upr.edu); **Pattern Santa Isabel, LLC** to Carlos Fernández Lugo, Esq. [cfl@mcvpr.com](mailto:cfl@mcvpr.com) and to Ignacio Vidal J. Cerra [ivc@mcvpr.com](mailto:ivc@mcvpr.com); **NRG Energy Inc.** to Carlos Valdejuly, Esq. to [carlos.valdejuly@oneillborges.com](mailto:carlos.valdejuly@oneillborges.com), Fermín Fontanes, Esq., to [fermin.fontanes@oneillborges.com](mailto:fermin.fontanes@oneillborges.com), and Ana Rodríguez, Esq. to [ana.rodriguez@oneillborges.com](mailto:ana.rodriguez@oneillborges.com); **Oficina Estatal de Política Pública Energética** to Edwin J. Quiñones Porrata, Esq. [Edwin.quinones@aae.pr.gov](mailto:Edwin.quinones@aae.pr.gov); **Asociación Puertorriqueña de Energía Verde** to Alan M. Rivera Ruíz to [energiaverdepr@gmail.com](mailto:energiaverdepr@gmail.com); **Ferraiuoli, LLC** to Lillian Mateo-Santos, Esq. to [lmateo@ferraiuoli.com](mailto:lmateo@ferraiuoli.com).




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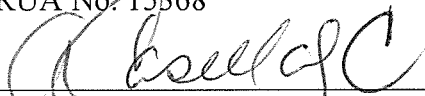
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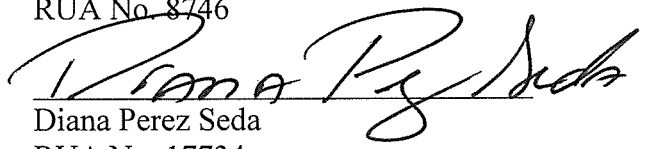
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COMMONWEALTH OF PUERTO RICO  
PUERTO RICO ENERGY COMMISSION

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IN RE: INTEGRATED RESOURCE \* No. CEPR-10-2015-0002  
PLAN FOR THE PUERTO RICO \*  
ELECTRIC POWER AUTHORITY \*

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TRANSCRIPT FROM RECORDED AUDIO

TECHNICAL HEARING

APRIL 6, 2016

9:00 A.M. TO 6:30 P.M.

1 was that they had to have air cool  
2 condensers, in other words, that  
3 they couldn't use once-through  
4 cooling, so there wouldn't be any  
5 discharges, and also being best  
6 available technologies, the use of  
7 water would be minimized to the  
8 best possible usage, which means  
9 that they use less than the current  
10 plans.

11 So basically, by design, we  
12 eliminate discharges, and by  
13 design, we reduce consumption with  
14 respect to the current plans. So,  
15 yes, water was very much a concern.

16 MS. SANTIAGO: Okay. May I  
17 follow up?

18 MR. CARO: Yes.

19 MS. SANTIAGO: But that was not  
20 my question.

21 So my question was, why do you  
22 not compare and consider -- there's  
23 no -- in the IRP, there is no  
24 section dedicated to -- what you're  
25 saying is we are going to use air

1           cooling or once-through cooling  
2           towers --

3           DR. BACALAO: No once-through,  
4           uh-huh.

5           MS. SANTIAGO: But what I am  
6           asking is, why are you not  
7           comparing water impacts of thermal  
8           generation as opposed to renewable?

9           MR. CARO: Please identify for  
10          the record.

11          MR. MARRERO: Yeah. Rafael  
12          Marrero from PREPA. Basically the  
13          expected use of raw water -- I  
14          mean, we already are following or  
15          pursuing through a different  
16          process different measures and  
17          alternatives to use water coming  
18          from the Patillas Lake and reuse  
19          the waters inside the typical  
20          waters that are wastewater that we  
21          discharge to the ocean, we are  
22          going to be reusing that. So, I  
23          mean, this is not part of the IRP,  
24          but those measures have already  
25          been developing in the Aguirre

1 supported by the prior knowledge of  
 2 strategist results and the  
 3 supplemental evaluations and the  
 4 screening of thermal options.

5 And I believe as far as I am  
 6 aware that this is the first time  
 7 in a formal either presentation or  
 8 document from PREPA that we have  
 9 heard about the use of the  
 10 strategist model. Can you briefly  
 11 talk about how the strategist was  
 12 employed in this and in what  
 13 context those model results were  
 14 used?

15 DR. BACALAO: To cover it, I  
 16 can talk about it. When we started  
 17 this process, there was a prior  
 18 study conducted by another firm  
 19 that they used a strategist, and  
 20 when we defined our scope, we  
 21 started that as a given knowledge,  
 22 the revision of that document. We  
 23 were calling it at that time the  
 24 Phase 1 IRP. And the main result  
 25 of that study was PREPA to replace

1 its entire -- the entirety of the  
2 fleet by something like 2021, which  
3 was -- made good economic sense,  
4 and that's why I brought some of  
5 the graphs that show why that  
6 result made good economic sense,  
7 but didn't make a practical sense.

8 Also, they used less detailed  
9 information on the modeling of the  
10 units. So we said, okay, in this  
11 phase, starting from this  
12 knowledge, let's fine-tune this,  
13 let's produce a detailed expansion  
14 plan based on that knowledge, and  
15 the restriction of permitting and  
16 construction, and then model in  
17 more detail the units, model in  
18 more detail the transmission  
19 system, which was not modeled  
20 originally. Model in more detail  
21 the renewable on an hourly basis,  
22 so that was our starting knowledge.

23 MS. MIRANDA: Excuse me. I  
24 want to clarify something  
25 because --

1 DR. FISHER: Sorry. And have  
2 you heard any concerns from AES  
3 about future environmental  
4 compliance concerns that could be  
5 passed through to PREPA?

6 MS. MIRANDA: No. If they,  
7 for example, have -- you know, in  
8 these meetings, if they have totals  
9 that the amount of investment that  
10 they have to do, it will be so much  
11 that it will be affecting the cost  
12 to us you mean?

13 DR. FISHER: Yes.

14 MS. MIRANDA: No, not related  
15 to environmental matters.

16 DR. FISHER: And just a general  
17 question about PPOAs. When PREPA  
18 examines looking at new thermal  
19 resources in the forward-looking  
20 plan, is there an explicit  
21 contemplation if those resources  
22 are built and owned by PREPA or  
23 whether they are built and owned by  
24 a third party and contracted to  
25 PREPA?

1 DR. BACALAO: No. Basically  
2 the analysis done agnostic  
3 (phonetic) with respect to  
4 ownership, just put the capital  
5 cost, the O and M cost, the fuel  
6 cost.

7 DR. FISHER: Thank you.

8 MR. CARO: Now is the turn of  
9 the intervenors. According to the  
10 list is consortium.

11 MR. CLARK: Ivan Clark from  
12 Leidos.

13 As the -- included in the IRP,  
14 expansion of the existing gas port  
15 infrastructure that supplies Costa  
16 Sur and proposed construction of  
17 new natural gas fired combined  
18 cycle generation using such  
19 infrastructure, that is not  
20 included as a future-specific  
21 scenario in the IRP. Part of the  
22 reasons stated by PREPA implies  
23 that there's challenges with  
24 transmission to the north which  
25 causes that.



1 UNIDENTIFIED SPEAKER:

2 (Inaudible.)

3 MR. CARO: Okay. From the  
4 OEPPE?

5 MR. QUINONES: No questions.

6 MR. CARO: Thank you,  
7 Mr. Quinones.

8 From WindMar, Counsel Romaine?

9 MR. ROMAINE: No questions.

10 MR. CARO: Thank you very much.  
11 From ELAC and Comite Dialogo?

12 MS. SANTIAGO: Yes. Ruth  
13 Santiago for the record.

14 MR. CARO: You may proceed.

15 MS. SANTIAGO: In the base IRP,  
16 Siemens prepared the base IRP and  
17 recommended in Table 2 -- well, it  
18 turned into 3.2, 3.3, 3.11, 3.18,  
19 3.17, numerous references where  
20 Siemens is recommending the H  
21 class, the Siemens SSC-8000 H  
22 class, the three SSC or Siemens  
23 combined cycles 800, the F class is  
24 a Siemens SSC6-5000F. And even  
25 when there were competitive

1 machines that might do better, in  
2 footnote, for example, 19, which  
3 became 21, Siemens indicates that  
4 the STG -- I'm sorry, SGT6-8000H  
5 was similar to the generic H class  
6 and so that --

7 DR. BACALAO: We used the  
8 generic --

9 MS. SANTIAGO: You are  
10 recommending all Siemens  
11 machines --

12 DR. BACALAO: No. No. First  
13 of all and for the record, our  
14 likelihood of Siemens PTI is  
15 consulting. We are completely  
16 separate, even organizationally,  
17 from Siemens PG. We only access  
18 those guys when our customers ask  
19 us to get information. When we  
20 selected these units, we went out  
21 of our way to demonstrate this just  
22 an indication of the unit.

23 The H class, by the way, we  
24 used the generic because we didn't  
25 like some of the performance of the

1 I think it's significantly  
2 important for us to really see the  
3 transparency on the costs. And  
4 generalizations really aren't going  
5 to be enough. We are really going  
6 to need specifics. And I also  
7 think that looking at this we need  
8 to be careful we try to separate  
9 the IRP from the cost borne by the  
10 consumer. We can't look at this in  
11 a vacuum.

12 So to that point, does the  
13 PREPA IRP plan constitute really an  
14 all-or-nothing approach or  
15 approval, and to what extent is  
16 that IRP an independent process for  
17 the need to serve the credit  
18 obligations now and in the future?

19 MS. MIRANDA: I don't  
20 understand the second question.

21 MR. RICKMAN: Do you need me to  
22 rephrase?

23 DR. BACALAO: Yes, please.

24 MS. MIRANDA: I didn't  
25 understand.

1 MR. RICKMAN: I will rephrase  
2 it. This is Ron Rickman again.

3 You indicated in the very  
4 beginning of your IRP that this  
5 approval of this IRP will be very  
6 important in the business plan  
7 negotiations or discussions with  
8 your creditors; therefore, it seems  
9 that there would be some influence  
10 to the IRP to suffice some of those  
11 aspects that you would need to have  
12 with your creditors. To what  
13 extent was that influence in here?  
14 Does that -- or do you need a  
15 further explanation?

16 MS. MIRANDA: This is Sonia  
17 Miranda from PREPA. And maybe this  
18 is not completely related to the  
19 IRP, and I want to make that clear.  
20 But the IRP was something that we  
21 worked on an expedite manner not  
22 only because we need to comply with  
23 Act 57, but also because it was  
24 part -- or it was -- it created the  
25 basis to develop the business plan,

1           which was something that we need to  
2           comply with our new associations  
3           with our creditors.

4           But we have already presented  
5           the business plans to the  
6           creditors, and that was a portion  
7           of the discussion that we have with  
8           the creditors, and after that we  
9           kept this restructuring support  
10          agreement. So right now still we  
11          have to -- we have been consistent  
12          with what we have evaluated there  
13          with what we proposed here, but  
14          still this was an ongoing process  
15          and it is a dynamic process. We  
16          are still revising this document  
17          because we have new requirements  
18          from the commission. And we have  
19          done modifications or changes in  
20          terms of your recommendations, and  
21          that does not imply that we have  
22          effected the negotiations or  
23          something with our creditors.

24                 MR. TORRES: Follow-up?

25                 MR. CARO: Yes.

1 generation. One of them was the F  
2 class, which is a high efficient  
3 unit. And as you can see -- but  
4 it's large, unfortunately. It is  
5 very large. And that's what made  
6 the recommended Portfolio 3. The  
7 problem with it is that it's large.  
8 Then you have the option of a much  
9 smaller combined cycle, like the  
10 SST-800. And this is just an  
11 example of those. It is less  
12 efficient, but it is a lot more  
13 flexible. You have now chance of  
14 about 70 megawatts instead of close  
15 to 400 in the F class.

16 And then there are  
17 reciprocating engines. These are  
18 diesel engines. And they are a  
19 little bit more expensive. A lot  
20 more smaller. They are about  
21 20 megawatts, 17 megawatts each.  
22 So it's even more flexible but it's  
23 more expensive. So this was  
24 another input into our design.

25 Finally one key input, and I

1 want to share this with you now,  
2 and I will share it later as well,  
3 is the need to integrate  
4 renewables. This shows you what  
5 would happen if you had the  
6 investment plan that eventually  
7 resulted from considerably limited  
8 capital. And here we see what  
9 would happen if we were to follow  
10 the mandates of law.

11 And what we see here is a  
12 curtailment. At one time we get up  
13 to 20 percent of the energy that  
14 would be supplied from the  
15 renewables have to be restricted.  
16 The system cannot take it. You  
17 don't have enough load to supply it  
18 to. And everything is at a minimum  
19 and you cannot take it. Because  
20 under the current contracts, PREPA  
21 would have to pay for it. And that  
22 would apply a cost of about  
23 \$74 million per year at that point.

24 So then when we designed the  
25 portfolio, we said, okay, we need

1 to achieve this. What can we do?  
2 And this what's showing next, we  
3 need to advance the retirement of  
4 PREPA fleet. Basically we need to  
5 retire Aguirre sooner. We need to  
6 retire Costa Sur sooner. And even  
7 if we advance them as much as we  
8 can, capital is not an issue. The  
9 only issue is that permitting and  
10 getting things built as soon as you  
11 can, even in that case, by 2020 you  
12 still have high curtailment. And,  
13 finally, when you get everything  
14 built, your curtailment goes down,  
15 and you have good, acceptable --  
16 well, acceptable performance. So  
17 that's another criteria.

18 We wanted to replace PREPA's  
19 fleet as soon as practical because  
20 we needed to incorporate renewables  
21 without having unrealistically high  
22 curtailment.

23 The other aspect, and we will  
24 get into these in more detail  
25 later, but it's basically



1 would require higher ACFs on  
2 Page 516 of the base IRP. Aguirre  
3 will require higher annual capacity  
4 factors. Right?

5 DR. BACALAO: Uh-huh.

6 MS. SANTIAGO: And yet because  
7 you are acknowledging that you have  
8 that limitation, that permit  
9 limitation that allows Aguirre --  
10 the combined cycle units to operate  
11 at 35 percent ACF, right? And the  
12 steam units at 55 percent, right?

13 MR. BACALAO: Okay.

14 MS. SANTIAGO: So how do you  
15 handle that? How do you work  
16 within that limit that's provided  
17 by the permit that EPA said, you  
18 know, you can only go if you do  
19 AOGP, right, and you provide  
20 natural gas to the Aguirre units,  
21 but within these limits, and yet  
22 you are saying, well, in order to  
23 comply with some other  
24 requirements, I have to go beyond  
25 those limits. So how do you --

1 or wait?

2 MR. CARO: No, right now. Now.

3 MS. SANTIAGO: Okay.

4 Ms. Santiago for the record.

5 I did not see in the IRP any  
6 factoring in of the public health  
7 costs of fossil fuel generation,  
8 particularly to the communities  
9 that are closest to the big PREPA  
10 plants. I think that would be  
11 important to consider and to  
12 include, and specifically a look at  
13 morbidity and mortalities rates in  
14 the communities that are close to  
15 big PREPA plants.

16 Another, if I may?

17 MR. CARO: What is the  
18 question?

19 MS. SANTIAGO: Can they include  
20 a discussion of public health cost  
21 of fossil fuel generation,  
22 particularly to the communities  
23 closest to the big plants?

24 MS. MIRANDA: As we explained  
25 this morning, even some of the