

**COMMONWEALTH OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION**

SECRETARIA
COMISION DE ENERGIA DE
PUERTO RICO

'17 MAY 17 P4:34

IN RE: AGUIRRE SITE ECONOMIC
ANALYSIS

CASE NUM.: CEPR-AP-2017-0001

SUBJECT: ARCTAS compliance to
Commission's Order (May 3, 2017) to submit
proposal in testimony form and include
related workpapers.

**ARCTAS COMPLIANCE WITH COMMISSION ORDERS TO SUBMIT
PROPOSAL IN TESTIMONY FORM AND INCLUDE RELATED WORKPAPERS**

TO THE HONORABLE PUERTO RICO ENERGY COMMISSION:

NOW COMES Arctas Capital Group, LP ("Arctas"), through the undersigned legal counsel, respectfully STATES and PRAYS:

I INTRODUCTION

1. On February 10, 2017, in an effort to move forward with an evaluation of Aguirre Offshore GasPort ("AOGP"), the Puerto Rico Energy Commission ("Commission") issued its Order initiating the proceeding on the Aguirre Site Economic Analysis ("Order"), Case No. CEPR-AP-2017-0001. The Order requires the Puerto Rico Electric Power Authority ("PREPA") to conduct an economic analysis of its plans for the Aguirre Site on or before April 10, 2017. The Order also requested Intervenors to present alternative analysis to the Commission following the same schedule required to PREPA.

2. The Commission, at PREPA's substantiated request, extended its due date to May 21, 2017, for PREPA and all its Intervenors with the Order.
3. On April 21, 2017, Arctas, in compliance with the Order and its subsequent orders, filed with the Commission Arctas proposal for evaluation of alternatives to AOGP for the Commission to consider during review and assessment of AOGP economic analysis ("Arctas Proposal").
4. On May 3, 2017, the Commission issued its Order requesting Arctas to submit its proposal in a testimony format ("Arctas Order") by having an expert file its credentials and support the analysis and information as filed in its proposal. The Order also request Arctas to file workpapers supporting Exhibits I-III, with formulae and links intact and sources provided for all hardcoded values.
5. On May 16, 2017, the Commission issued its Order which included a request for Arctas to submit its proposal in a testimony format as per Arctas Order by May 17, 2017.
6. Arctas presented the Arctas Proposal to introduce a more comprehensive and broader analysis of alternatives to AOGP, to supplement the limited binary analysis of AOGP versus no AOGP. Until the alternatives discussed therein have been fully evaluated, Arctas is not in a position to recommend for or against AOGP or any alternative.

II. ARCTAS COMPLIANCE WITH ARCTAS ORDER

7. In compliance with the Commission request, Arctas has assured testimony of the following Arctas officer that worked on the details of the Arctas Proposal. The

testimony is that offered by Rick Sierra. Such testimony is included herein and forms part of this Motion.

8. Arctas has also included herein two excel file titled **Arctas Proposal CEPR-AP-0001 Exhibits I-III** and **13 PREPA Response ROI DRR CEPR-AH-01-**

04_Attach 01. These files represents the workpapers supporting Exhibit I-III of Arctas Proposal as requested by the Commission.

9. Arctas is presenting, with this motion, a copy of the notarized testimony. The original, with its county clerk certificate certifying the notary, is being sent from Houston, Texas, and shall be filed with the Commission.

WHEREFORE, Arctas respectfully request the Commission to take notice of the above with its attached Exhibits, declare Arctas compliance with Arctas Order and any other relief the Commission may deem proper.

I CERTIFY: I have sent an exact copy of this Motion, regarding Case No. CEPR-AP-2017-0001, the date the Commission stamped this Motion, to the following emails:

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RESPECTFULLY SUBMITTED in San Juan, Puerto Rico, this 17th day of May,
2017.

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COMMONWEALTH OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION

IN RE: AGUIRRE SITE ECONOMIC
ANALYSIS

CASE NUM.: CEPR-AP-2017-0001

SUBJECT: Direct Testimony of RICK SIERRA in
representation of Arctas Capital Group, LP.

DIRECT TESTIMONY OF

RICK SIERRA

Vice President Arctas Capital Group, LP.

May 17, 2017

Witness Identification

1. State your name, title, company you work for and work address.

Response: My name is Rick Sierra. I am Vice President at Arctas Capital Group, LP. My business address is 1330 Post Oak Blvd., Suite 1375, Houston Texas 77056

2. Are you testifying on your own behalf or on behalf of another person?

Response: I am testifying on behalf of Arctas Capital Group, LP.

3. Have you testified under oath to the Commission in the past?

Response: I have not.

4. Why are you presenting this testimony to the Commission?

Response: The Commission issued an Order notified May 3, 2017 to Arctas to submit its Proposal, filed April 21, 2017, in a testimony format by having an expert file its credentials and support the analysis and information as filed in its proposal.

Summary of Direct Testimony and Attachments

5. What are the purposes and subject of your direct testimony?

Response: My testimony addresses the following:

- a. I present Arctas Proposal for Evaluation of Alternatives to AOGP
- b. I explain Arctas interest in the instant proceeding
- c. I describe Arctas AOGP observations, including anticipated perspectives and concerns financial parties may have regarding financing AOGP or an Alternative
- d. I explain the need to evaluate Arctas identified Alternatives
- e. I present a summary of Arctas identified Alternatives to AOGP
- f. I present Arctas recommendations, conclusions, and requests to the Commission

6. Please summarize Arctas recommendations, conclusions, and requests to the Commission

Response: Arctas recommends PREPA complete several analyses and risk assessments, as well as provide costs and other information that will provide for a more complete assessment of AOGP and Alternatives.

Arctas concludes that a current economic analysis of all viable plans to add LNG that significantly increase natural gas fired generation in Puerto Rico is necessary in order for any selected project to secure financing and begin construction, and that some plans may serve as contingency plans. It is easier and more efficient to do this analysis now rather than later, to ensure that the right plan is being pursued and valuable time and money is not wasted.

Arctas requests the Commission require PREPA i) complete the recommendations stated herein, and ii) continue to identify, monitor, and assess alternatives as they arise.

39 7. Are there any exhibits attached to your summary?

40 **Response:** Yes. My testimony includes the following link to my CV and an excel file:

41 a. My CV is obtained with the following link [http://arctas.com/index.php/rick-](http://arctas.com/index.php/rick-sierra)
42 [sierra](http://arctas.com/index.php/rick-sierra).

43 b. Excel Arctas file titled **Arctas Proposal CEPR-AP-0001 Exhibits I-III** in cd format.

44 c. Excel PREPA file titled **13 PREPA Response ROI DRR CEPR-AH-01-04_Attach 01** in
45 cd format

46 **Qualifications and Professional Background**

47 8. What are your responsibilities with Arctas?

48 **Response:** Provide business development management of LNG, natural gas pipelines,
49 and power generation opportunities. With company executive management and
50 industry partners, develop strategies, project concepts, and financial models. Manage
51 consultants, legal advisors, environmental and engineering firms, including specialty
52 companies for power generation, mid-scale LNG production and marine infrastructure,
53 regasification facilities, and natural gas pipelines for projects. Establish development
54 budget, overall CAPEX requirements, and project schedule. Participate in development
55 and negotiation of key agreements including partnership, supply/off-take, and EPC.
56 Oversee project configuration and production capacity development, site options,
57 execution plan, and permit development and filings.

58 9. State your educational background and professional experience.

59 **Response:** I am an energy executive with over 25 years of domestic and global
60 experience in the energy industry, with the past 11 years in executive leadership roles.
61 Extensive background in development, construction, and management of power
62 generation, natural gas transmission, and mid-scale liquefied natural gas (LNG)
63 infrastructure projects.

64
65 I have a BS in Engineering Science from Baylor University. I also have a BS in Mechanical
66 Engineering and MBA 2004 from the University of Texas, Austin. I am a licensed
67 professional engineer in the State of Texas.

68 **Arctas Proposal for Evaluation of Alternatives to AOGP**

69 10. Arctas interest in the instant proceeding

70 a. What is Arctas main purpose as an Intervenor in this proceeding?

71
72 **Response:** Arctas has an interest in participating in projects that result in
73 additional LNG supply and natural gas fueling for power generation in Puerto
74 Rico. This could be AOGP, and/or the proposed Aguirre repowering, if these are

found to be the best alternatives for Puerto Rico. Or it could be another alternative.

b. What does Arctas intend the Commission accomplish with such Proposal?

Response: AOGP would be the largest public/private energy project ever attempted in Puerto Rico. Arctas supports the efforts of the Commission to make a final determination about AOGP.

Arctas is presenting this motion to propose a more comprehensive and broader analysis of alternatives to AOGP, to supplement the limited binary analysis of AOGP versus no AOGP.

Arctas submits recommendations for the Commission to consider during the review and assessment of economic analyses submitted by PREPA.

11. Arctas AOGP observations

a. What is Arctas position on the Aguirre Offshore Gas Port?

Response: PREPA has strongly supported AOGP and its views should be given considerable weight. The fact that significant time and effort has been spent on AOGP should also be given significant weight and should be considered in light of future costs to implement AOGP or any alternative.

Arctas has evaluated available information regarding the AOGP project and certain other alternatives that can supply a sufficient quantity of natural gas to produce approximately 525 MW or more of natural gas fired generation capacity at Aguirre, which is a large enough project to have a significant impact on the cost of generation in Puerto Rico. However, at this time, Arctas is not able to complete an assessment to determine which project has the best combination of probability to i) successfully complete development and secure favorable financing terms, and ii) achieve forecasted positive economic benefits during the operations phase.

b. Explain reasons why AOGP remains controversial.

Response:

- i) AOGP principally involves building a new LNG import terminal less than 30 miles from an existing one, EcoElectrica.
- ii) Outside of densely-populated Japan, where each LNG terminal fuels several times the power capacity of EcoElectrica, nowhere in the world are two LNG import terminals for power plants located so close to each other; this is due to their high cost and siting challenges.

- iii) For a LNG terminal its size, a large portion of the EcoElectrica LNG terminal capacity is not utilized.
- iv) When built, EcoElectrica was designed to have twice as much LNG storage, allowing much higher throughput. This was never added, and no pipelines were ever built to carry gas from EcoElectrica to any place except Costa Sur.
- v) A 42-mile pipeline that could supply gas from EcoElectrica to Aguirre was fully permitted and all land crossing agreements completed in 2008. The project was cancelled after completing approximately 25% of the pipeline, perceived by some to be largely for political reasons.
- vi) By industry standards, a 42-mile pipeline is tiny. The Houston metropolitan area, roughly the size of Puerto Rico, has over a thousand miles of gas transmission pipelines, as well as smaller distribution lines to almost every home and business. Gas pipelines are viewed in communities globally as a safe and clean source of low-cost energy.
- vii) The cost of completing the marine infrastructure for Aguirre is several times the cost of a pipeline, and could instead be used for upgrading the Aguirre power plants or other Island priorities.
- viii) The AOGP analysis assumes all of the units that comprise 1400 MW of the existing 40-year old Aguirre complex need to be kept in service for several years and in some cases 10 or more years despite Puerto Rico having a significant excess of generation capacity over its baseload and peak power needs, even before new renewables are considered.

c. What will financial markets observe about the AOGP project?

Response: Financial markets will observe that the initial adoption of AOGP occurred at a time (i) when the gap between oil prices and LNG prices were significantly greater than today; (ii) when EPA seemed significantly more hostile to thermal power plants than it may be today, and more eager to impose punitive MATS enforcement; (iii) when the economic situation for Puerto Rico and PREPA appeared to allow for greater capital spending and commitments than today, and made imposition and collection of fines by EPA more credible than they are today; (iv) before Congress had indicated a recognition of the Island's economic situation; and (v) at a time when solar energy was far more

expensive than it has dropped to today, and less likely to meaningfully reduce the need for excess thermal capacity.

Financing parties and investors, as well as the people of Puerto Rico, will expect any conclusion about the Project to be applicable to today's circumstances and projected future needs well as those when AOGP was first endorsed.

- d. What will financial parties want to understand about the existing and proposed power generation projects at Aguirre?

Response: The financial markets will want to understand why PREPA needs to spend \$135 million to refurbish or convert Aguirre's aging, inefficient plants to gas to maintain approximately 5100 MW of thermal capacity for an electric system with a peak of 3600 MW, before taking into consideration growing renewable supplies. Because debt and government guarantees are limited, each project that is undertaken will be seen as reducing the credit available for all projects.

Financing parties will observe the following:

- i) The Base IRP indicates that PREPA currently has over 5100 MW of available thermal capacity to serve a forecasted system peak loads of approximately 3300 MW. In addition, there is existing renewable capacity and PREPA plans to add more, which may lower the amount of thermal capacity required or require smaller flexible capacity be added in locations other than Aguirre.
- ii) Aguirre 1 & 2 CC is currently dispatched only infrequently, and would not significantly lower its cost of generation to dispatch much more even if run on LNG unless it was repowered.
- iii) One could convert Aguirre 1 & 2 CC to natural gas by adding new combined cycle gas turbines rather than converting the old ones to burn natural gas inefficiently. Repowering Aguirre 1 & 2 CC immediately as a 526 MW efficient combined cycle, baseload plant would save \$46 million in conversion costs, and significant fuel costs versus running the old plant on natural gas. It is confusing why an additional \$46 million is needed for conversion when PREPA Financial Statements, Required Supplementary Information and Supplemental Schedules Years Ended June 30, 2009 and 2008 p. 11 indicate that the

- 188 conversion of the Aguirre 1 & 2 CC gas turbines to burn either
189 natural gas of #2 fuel oil was completed in fiscal year 2009.
190 iv) If that repowering is done, it may be possible to avoid the \$87
191 million conversion of Aguirre 1 & 2 ST as well. With all the
192 other generation on the electric system and a new baseload
193 combined cycle plant, perhaps the Aguirre 1 & 2 ST units could
194 be designated as limited use, to comply with environmental
195 regulations, until such time the capacity is no longer needed
196 and the units could be shut down.
197 v) The new H-class CC that PREPA targeted for 12 years hence in
198 the Base IRP, could be permitted, financed and built within a
199 4-year timeframe (perhaps less if the project is eligible for an
200 expedited permitting process) if analysis suggests more
201 generation is needed at Aguirre than the 526 MW of
202 repowered Aguirre 1 & 2 CC.

203 If Aguirre 1 & 2 ST are designated limited use and not needed except as standby
204 generation, a pipeline that can fuel the baseload repowered Aguirre 1 & 2 CC
205 would be sufficient, making AOGP's higher volumes and therefore its capital cost
206 unnecessary. This is an issue financing parties and investors will want to be
207 assessed that the Commission can include in its current evaluation.

- 208 e. Why is an updated assessment of AOGP important for project financing?
209

210 **Response:** Projects such as AOGP and any alternatives should be rigorously
211 analyzed so as to not only determine the long-term impact to electric system
212 generation costs, but also to establish information and analysis that will support
213 later efforts to complete development and secure favorable terms for financing
214 for selected projects. Lenders want to be sure any large project they finance
215 makes long-term sense compared to alternatives. Arctas experience in
216 distressed situations and financing projects in non-investment grade markets
217 suggests that during development, any proposed energy infrastructure project in
218 Puerto Rico will need to address project risk associated with i) obtaining all
219 governmental approvals and permits in a timely fashion, and ii) not being
220 competitive with reasonable alternatives that would use less of the limited
221 government or PREPA credit capacity. Inability to satisfactorily demonstrate
222 that a preferred project is the best option may lead to development uncertainty
223 and delays to the financing effort, which could also lead to additional
224 development costs.
225

In order to obtain financing for any project, it should be anticipated that lenders will require that the project promoters show the project is financially viable and demonstrably superior to other alternatives. This would include alternatives to AOGP that can also supply large quantities of natural gas to Aguirre whether proposed in this proceeding or proposed or discussed in the past. Such alternatives include previously identified projects such as delivering natural gas from EcoElectrica to Aguirre via pipeline, as discussed in the Base IRP.

f. Why should MATS compliance approaches be revisited?

Response: A key driver of the PREPA plan to convert Aguirre 1 & 2 ST to natural gas, and allowing them to burn natural gas inefficiently at their existing high heat rates rather than immediately replacing the units, was to bring the units into MATS compliance under US EPA rules, and minimize potential non-compliance fines. The US election has brought in a new team and philosophy at EPA; and given Congressional support for Puerto Rico financial stability, the new EPA (and the financial markets and the Island's Congressional supporters) may view a lower cost plan to add new, efficient baseload gas-fired equipment at Aguirre as more favorable, even if it means running Aguirre 1 & 2 ST a little longer on #6 fuel oil. This could be accomplished either by accelerating the Aguirre 1 & 2 CC repowering, or proceeding immediately with the H-class installation. Either way, the \$135 million conversion cost would be saved as well as Aguirre CC fuel oil costs prior to the existing plan's proposed year 6 repowering.

12. Evaluation of Arctas identified Alternatives

a. Why does Arctas recommend the Alternatives to AOGP be evaluated?

Response: To fully evaluate the viability of AOGP, it would be useful to have not only an up to date AOGP assessment, but also assessments for reasonable alternatives. Not only will this help ensure future resources are spent on a viable project in pursuit of financing, it can also serve as the basis for identifying contingency solutions that warrant further development in the event that the preferred project does not proceed for any reason.

This would also include alternatives to spending approximately \$135 million to convert existing over 40-year-old equipment at Aguirre to burn natural gas rather than installing new, efficient gas burning equipment at a lower overall cost and lower future fuel cost.

b. Why hasn't Arctas completed its own economic analysis of the Alternatives?

Response: At this time, neither Arctas, and we believe no other party, is able to fully evaluate AOGP versus these alternatives because the alternatives depend on the construction of new infrastructure and/or modifications to existing infrastructure whose full scope of work and resulting capital cost, to our understanding, has not been evaluated by PREPA (or the evaluation has not been made public), nor is complete dispatch information to do a third-party analysis publicly available. As such, rather than individually requesting that PREPA provide Arctas model inputs to do an independent economic analysis, Arctas is proposing how and why PREPA or the Commission should have such evaluation done.

Until the alternatives discussed herein have been fully evaluated, Arctas is not in a position to recommend for or against AOGP or any alternative. Arctas believes potential financial parties and investors in AOGP will be similarly handicapped and that the proposed analysis will clarify whether AOGP and its associated expenditures at Aguirre are or are not the best solution for Puerto Rico.

13. Summary of Arctas identified Alternatives to AOGP

a. Describe the Alternatives

Response: Included in the Commission's Order dated February 10, 2017 for this proceeding is the requirement for PREPA to model scenarios that assume AOGP is not built, which results in no units at the Aguirre Site operating on natural gas now or in the future. However, the binary choice of either AOGP, or no gas at all, is not the way the financial community will look at the situation. Because there are easily understood alternatives that appear to be significantly lower cost than AOGP, which involve bringing more gas through EcoElectrica, Arctas believes the financial markets will want to understand why these were not chosen. These alternatives to get natural gas to Aguirre besides AOGP, are as follows:

Alternative 1 - Build a 42-mile natural gas pipeline from EcoElectrica to Aguirre to supply 93 MMSCFD to Aguirre, which is equivalent to another new plant of similar size as EcoElectrica.

Alternative 2 – In addition to building a natural gas pipeline from EcoElectrica to Aguirre, charter a Floating Storage Regasification Unit ("FSRU") that would continuously moor at the EcoElectrica jetty where LNG carriers currently deliver

LNG to the EcoElectrica LNG terminal. This would increase the amount of gas that could be delivered through the pipeline from 93 MMSCFD to a 400 or 500 MMSCFD.

- b. What is required to implement the alternatives that could supply natural gas to Aguirre?

Response:

Alternative 1

- i) PREPA developed, permitted, obtained the land rights and partially completed this project (called the "Gasoducto del Sur") before it was cancelled in 2009. At the present time, Arctas is informed through public filings that EcoElectrica has capacity to send out the additional 93 MMSCFD of natural gas without new permitting modifications to its facility. This amount of gas could fuel the Aguirre 1 & 2 CC repowering, or the new H-class turbine PREPA proposes at Aguirre, with potentially some gas left over for minimal use at the Aguirre 1 & 2 ST plants.
- ii) Permitting the 42-mile pipeline would require a renewed permitting process since the majority of the permits for the Gasoducto del Sur are likely no longer valid or have expired. However, since PREPA previously obtained permits and land rights for the Gasoducto del Sur, such permitting requirements and land rights are well understood and, importantly, the permitting had been successfully completed and do not require the type of FERC and federal approvals needed for import projects like AOGP. As such, Arctas estimates that the pipeline could be permitted and built within a two-year period (especially if the project were eligible for an expedited permitting process). This alternative will be seen as costing significantly less than AOGP, and also avoiding AOGP's annual fixed and variable FSRU costs.
- iii) A pipeline with a much lower capital cost, will be seen as significantly more likely to be financed, and therefore more likely to occur, than a higher cost project.

Alternative 2

- i) LNG carriers delivering LNG to either the FSRU or to the EcoElectrica land based LNG storage tank could moor side by side to the FSRU during LNG offloading. A natural gas pipeline from the FSRU to the existing

EcoElectrica natural gas export pipeline would be built inside EcoElectrica property, as well as modifications to the jetty structure and mooring system to accommodate mooring the FSRU and LNG carrier side by side while offloading LNG or natural gas. Improvements to the jetty and a new natural gas pipeline would require modifications to permits, but would be relatively minor and significantly less costly in comparison to the permitting requirements for a new import facility, such as that being done for AOGP.

- ii) The FSRU cost would be equivalent to the daily rate of hire in the Time Charter Party and LNG Storage and Regasification Agreement dated March 17, 2014 for AOGP, as would the delivered LNG cost. [Note – EcoElectrica was originally designed and permitted to be able to add a second LNG tank, with underground geotechnical improvements done to support the second tank. To build this would require significant additional cooperation from EcoElectrica but make a permanent FSRU unnecessary.]

Both of these Alternatives 1 and 2 require PREPA to reach agreement with the owners EcoElectrica for the use of LNG terminal facilities to deliver and store LNG and deliver natural gas to the new pipeline.

- c. The Proposal includes Table 1, AOGP and Alternatives 1 & 2 financing and capacities ("Table 1"). Who prepared this table?

Response: I prepared Table 1.

- d. Please explain what cases are shown in Table 1.

Response: Table 1 below summarizes estimated costs and expected capacities of AOGP and estimates for the above mentioned two alternatives. There are two analyses for the AOGP and each alternative – one based on the financing assumptions used by PREPA as indicated in the 4th ROICEPR AP-2015-0001 Rate Case, 13 PREPA Response ROI DRR CEPR-AH-01-04_Attach 01 and the other based on financing assumptions Arctas believes should be expected for a large energy infrastructure project in Puerto Rico, under current financial and credit conditions. Arctas expected financing assumptions (and suggested sensitivities that should be analyzed) include:

- i) Debt financing at 75% of project costs

- ii) 8% fixed interest rate on project debt, with sensitivities run at 7, 9 and 10%
- iii) 15 year debt term, assuming a 17 year PPA or offtake agreement
- iv) Mortgage-style debt amortization (i.e., equal debt service payment each year)
- v) A 15% IRR for the 25% of the project cost financed by equity, with sensitivities run at 12, 14, 16 and 18%

Response: It is important to complete economic analyses assuming likely financing terms because the results are sensitive to the assumptions (similar to the way the results are sensitive to fuel pricing assumptions). For example, for Cases 1 and 2 shown on Table 1, whereby AOGP is built, the annual debt payment increases from approximately \$20 million when using the PREPA assumptions (assumptions more appropriate when the Puerto Rico and PREPA's credit ratings were higher) to approximately \$34 million using Arctas expected financing assumptions.

- f. Summarize the cases in Table 1.

Response: The values in the Table are based on the PREPA developed calculations from the 4th ROICEPR AP-2015-0001 Rate Case, 13 PREPA Response ROI DDR CEPR-AH-01-04_Attachment 1, made available by the Commission to Intervenors in this proceeding. Case 1 uses 13 PREPA Response ROI DDR CEPR-AH-01-04_Attachment 1 calculations as described below. Cases 2 through 6 follow a similar methodology as Case 1, with different assumptions as noted.

Case 1

Values for AOGP Offshore Project are as listed in 13 PREPA Response ROI DDR
CEPR-AH-01-04 Attachment 1.

The Financing Cost is calculated using the same formula for Financing Cost in 13 PREPA Response ROI DDR CEPR-AH-01-04_Attachment 1, 1% of 80% of the Sub-total value.

IDC is calculated using the financed amount plus the financing cost, PREPA assumed 5% interest rate, and PREPA assumed construction period 18 months.

Annual payment for the debt portion of the total fueling plant financed cost is the same formula for Financing Cost in 13 PREPA Response ROI DDR CEPR-AH-01-04_Attachment 1, Annual Payment. The amount is calculated using the financed amount plus the financing cost, with PREPA assumed 5% interest rate, and PREPA assumed term of 30 years.

The details of the financing and total costs for Case 1 and the following cases are shown in Exhibit I Fueling plan capital costs.

Case 2

The methodology for Case 2 is the same as Case 1, except that Arctas debt financing assumptions are used. Arctas financing assumption are:

- i) Debt financing at 75% of project costs vs 80% PREPA assumed
- ii) 8% interest rate vs 5% PREPA assumed
- iii) 15 year term debt vs 30 year term PREPA assumed

The annual cost of 15% IRR return on project costs financed with equity is shown as an additional cost.

Case 3

The methodology for Case 3 is the same as Case 1, except that the cost for AOGP are replaced with the cost of a pipeline from the existing EcoElectrica export pipeline the Aguirre Site.

For illustration, the pipeline cost of \$160 million, based on the \$4 million/per mile from the Base IRP Vol I 5.5.2.4, is used. Arctas recommends PREPA use the "Gasoducto del Sur" financial records to develop a better estimate of the possible pipeline cost.

The Back Office Components are 5% of the pipeline costs, based on the Back Office Components percentage of approximately 5% in Case 1.

Case 4

The methodology for Case 4 is the same as Case 3, except that Arctas debt financing assumptions as listed in Case 2 above are assumed.

Case 5

The methodology for Case 5 is the same as Case 3, except that illustrative costs for EcoElectrica jetty modifications and FSRU natural gas offloading pipeline are added to the cost of the \$160 million pipeline.

Case 6

The methodology for Case 6 is the same as Case 4, except that illustrative costs for EcoElectrica jetty modifications and FSRU natural gas offloading pipeline are added to the cost of the \$160 million pipeline.

Since Table I is comparing costs of LNG and natural gas infrastructure only, costs associated with the FSRU and power generation projects are not included in Table I; summaries of those costs are shown in Exhibit II FSRU cost and capacity and Exhibit III Power generation capital cost.

- g. What are the assumptions for Exhibits I-III?

Response: The assumptions for Exhibits I-III are shown in Exhibit IV Assumptions

- h. What does Table 1 indicate?

Response:

Alternative 1 (42 mile pipeline to Aguirre) is a \$235 million lower capital investment option than AOGP, but is limited to supplying only 93 MMSCFD to Aguirre instead of the 356 MMSCFD maximum assumed needed at the Aguirre Site with AOGP.

Arctas anticipates that the best use of the available gas would be in a new H class combined cycle plant at Aguirre (393 MW, 66 MMSCFD natural gas consumption at baseload). This would make converting the existing Aguirre 1 & 2 CC units and the Aguirre 1 & 2 ST to natural gas unnecessary, saving \$135 million, and reducing the amount of gas needed. Instead, Aguirre 1 & 2 CC units would be immediately repowered to operate either on gas or on #2 fuel oil, creating 526 MW of efficient capacity. The remaining 27 MMSCFD of natural gas capacity could be used in the repowered Aguirre 1 & 2 CC (it would supply approximately 25% of the 526 MW) gas turbines displacing a portion of the #2 fuel oil used to power Aguirre 1 & 2 CC. The nearly 400 MW from the new natural gas H-class CC and the 526 MW of mid-priced electricity from repowered

497 Aguirre 1 & 2 CC, could allow for Aguirre 1 & 2 ST to be shut down or designated
498 limited use units.
499

500 Alternative 2 (EcoElectrica FSRU with 42 mile pipeline to Aguirre) has
501 approximately \$166 million lower capital investment option than AOGP because
502 it would add infrastructure at EcoElectrica to Alternative 1. This alternative
503 provides the same amount of gas supply to Aguirre as AOGP, with lower cost,
504 and would allow construction of the same generation projects as assumed would
505 be done if AOGP were built if it is determined that is necessary to have over
506 5100 MW of thermal capacity. This alternative could provide estimated capital
507 cost savings of approximately \$166 million assuming illustration estimates of \$67
508 million to modify the EcoElectrica jetty and construct an offloading natural gas
509 pipeline, both of which require permitting. These estimates would need to be
510 confirmed.
511

512 i. Were worksheets created for Table I and Exhibits I-III?
513

514 **Response:** Yes, worksheets for Table I and Exhibits I-III are in Excel file: **Arctas**
515 **Proposal CEPR-AP-2017-0001 Exhibits I-III.**
516

517 j. Are there any other workpapers or files used to prepare the Proposal?
518

519 **Response:** No.

520 **Arctas Recommendations and Conclusion**

521 14. What are Arctas recommendations, which you are aware of, to the instant proceeding?
522

523 **Response:** Arctas respectfully recommends the Commission require PREPA provide the
524 following for the AOGP and Alternatives 1 & 2:

- 525 a. Complete economic analysis using expected financing terms rather than those
526 previously assumed by PREPA.
- 527 b. Determine whether converting or repowering old plants is the best use of
528 natural gas at Aguirre.
- 529 c. Assess risks associated with project financing and construction that may result in
530 additional costs and schedule delay, and quantify the possible impact on electric
531 system generation costs.
- 532 d. Identify and evaluate the impact of the cancellation costs for the AOGP FSRU in
533 the event a pipeline from EcoElectrica and/or lower need for existing Aguirre
534 units means a FSRU is not required in the future.

- e. Provide schedule to obtain all governmental approvals and permits, and complete a risk assessment of remaining approvals and permits that could result in schedule delays.
- f. Run scenarios for the Commission and Intervenors that show how much Aguirre 1 & 2 CC and Aguirre 1 & 2 ST would run, (i) if AOGP is built, (ii) if AOGP is not built but 93MMSCFD natural gas is available through a pipeline as described above, (iii), if Aguirre 1 & 2 CC are immediately repowered instead of the old units converted to run on natural gas, or (iv) if a new H-class CC is built immediately at Aguirre and the existing Aguirre 1 & 2 CC are run only as standby generation.
- g. In order for this evaluation to occur properly, it is important PREPA provide data and projections showing for 2014-2017, and for the next 5 years:
 - i) The amount of time, and under what circumstances, Aguirre 1 & 2 CC and Aguirre 1 & 2 ST have operated in the past.
 - ii) Aguirre 1 & 2 CC, Aguirre 1 & 2 ST, and the system dispatch profile, if 93 MMSCFD were available at Aguirre (other than through AOGP) beginning in year 3.
 - iii) Generation dispatch profile under conditions where either or both Aguirre 1 & 2 ST were unavailable, or one was unavailable and the other continued to run on fuel oil as now the case, or on a mix of natural gas and fuel oil as do the ST units at Costa Sur.
 - iv) Capital and fuel that could be saved, compared to the \$135 million conversion costs, if one or both of Aguirre 1 & 2 CC and Aguirre 1 & 2 ST were shut down or maintained as standby generation capacity without natural gas conversion; or if Aguirre 1 & 2 CC were immediately repowered with new turbines to burn natural gas efficiently.

15. What is conclusion has Arctas reached that you are aware of?

Response: Arctas believes a current economic analysis of all viable plans to add LNG that significantly increase natural gas fired generation in Puerto Rico is necessary in order for any selected project to secure financing and begin construction. It is prudent to identify and develop more than one plan in the event the preferred plan does not proceed for any reason, or conditions change that make an alternate plan more favorable than the preferred. It is easier and more efficient to do this analysis now rather than later, to ensure that the right plan is being pursued and valuable time and money is not wasted.

Arctas would be willing, at no cost, to work with PREPA and the Commission to convert the recommendations above into detailed model runs.

16. What action does Arctas ask the Commission take that you are aware of?

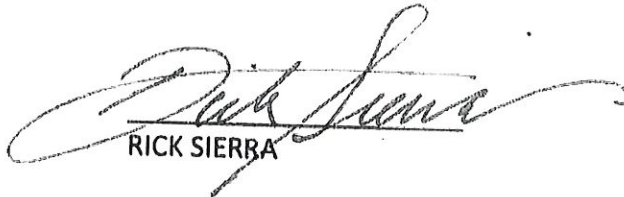
Response: Arctas requests the Commission require PREPA to:

- a. Complete the recommendations stated herein.
- b. Continue to identify, monitor, and assess alternatives in the event third parties make new proposals as PREPA's financial outlook becomes clearer and conditions improve.

[Attestation and signature on following page]

ATTESTATION
SIGNATURE PAGE

I, the undersigned, RICK SIERRA, of legal age, married, executive, and resident of Houston, Texas, in my capacity as Vice President at Arctas Capital Group, LP, state that the foregoing testimony, presented in written Question and Answer format, is true and correct to the best of my knowledge and belief.

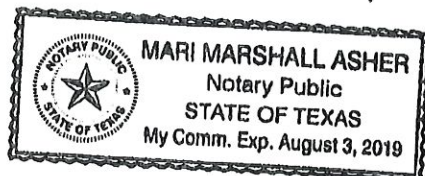

RICK SIERRA


STATE OF TEXAS
County of HARRIS

Before me, a Notary Public in and for said County and State, on this day personally appeared RICK SIERRA, known or lawfully identified to me to be the person whose name is subscribed to the foregoing instrument and acknowledged that the execution of said instrument by him has his voluntary act and deed.

Given under my hand and seal of office this 17th day of May, 2017.

My Commission expires on: August 3, 2019




Notary Public or Officer Authorized
to Administer Oaths