

**GOVERNMENT OF PUERTO RICO
PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU**

NEPR

Received:

Dec 23, 2020

5:56 PM

IN RE: IMPLEMENTATION OF THE
PUERTO RICO ELECTRIC POWER
AUTHORITY INTEGRATED RESOURCE
PLAN AND MODIFIED ACTION PLAN

CASE NO.: NEPR-MI-2020-0012

SUBJECT: Draft Procurement Plan

MOTION TO SUBMIT NOTARIZED AFFIDAVIT

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

COMES NOW the Puerto Rico Electric Power Authority through the undersigned legal representation and respectfully submits the notarized affidavit of Juan Diego Alvez Gandia as Exhibit A to the *Motion for Reconsideration of Resolution and Order on Draft Procurement Plan* filed yesterday, December 22, 2020.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 23rd day of December 2020.

/s Maralíz Vázquez-Marrero

Maralíz Vázquez-Marrero

mvazquez@diazvaz.law

TSPR 16,187

/s Katuska Bolaños-Lugo

Katuska Bolaños-Lugo

kbolanos@diazvaz.law

TSPR 18,888

DÍAZ & VÁZQUEZ LAW FIRM, P.S.C.

290 Jesús T. Piñero Ave.

Oriental Tower, Suite 1105

San Juan, PR 00918

Tel.: (787) 395-7133

Fax. (787) 497-9664

Exhibit A

**GOVERNMENT OF PUERTO RICO
PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU**

IN RE:

**IMPLEMENTATION OF THE PUERTO
RICO ELECTRIC POWER AUTHORITY
INTEGRATED RESOURCE PLAN AND
MODIFIED ACTION PLAN**

CASE NO.: NEPR-MI-2020-0012

SUBJECT:

Draft Procurement Plan

AFFIDAVIT OF JUAN DIEGO GALVEZ ANDIA

I, Juan Diego Galvez Andia, of legal age 43, and Senior Consultant of Sargent & Lundy, LLC, and a resident of Chicago, Illinois, state under oath as follows:

THAT My personal circumstances are the ones stated above.

THAT I have been a Senior Consultant for Sargent & Lundy LLC since 2015 and currently hold that position.

THAT my Background and Education is Electrical Engineering

THAT I have experience in Electrical Systems and Power System Analysis.

THAT in consideration of my background, education and experience I testify as follows in relation to the necessary studies and processes related to integration of renewable energy projects into the Puerto Rico Electric Power Authority (PREPA) transmission and distribution system.

THAT the statements set forth herein are my opinion as it directly relates to the consulting services that Sargent & Lundy is performing for PREPA and does not cover every possible situation or scenario.

THAT PREPA's consideration and selection of proposals for the development, construction and integration of new renewable and battery energy storage resources into the PREPA T&D system must incorporate a rigorous interconnection evaluation process. To be consistent with prudent utility practice, this process must include specific Interconnection Studies that will need to be performed based on the request for interconnection of new generating facilities and energy storage facilities. The objective is to identify the necessary upgrades to the existing transmission system facilities in the power grid to successfully integrate the new renewable energy and energy storage projects.

THAT the interconnection evaluation process generally followed in the U.S. electric utility industry, and which PREPA plans to follow, is as follows:

Studies Overview

The proposed interconnection study process PREPA outlines here is similar to the process followed by other large electric utility system operators in the United States. The process includes the following analytical stages:

Stage 1: Feasibility Study

Stage 2: System Impact Study

Stage 3: Facilities Study

Stage 1: Feasibility Study

The Feasibility Study assesses the practicality of integrating proposed renewable energy or energy storage project into the PREPA power grid. This study includes an initial assessment of the adequacy of the transmission system to accommodate the request for network integration of a new project. The study includes: short circuit analysis and load flow analysis. The study focuses on determining the preliminary scope for the necessary modifications at the interconnection facility (point of interconnection owned by PREPA) and other network upgrades required to integrate the renewable and storage projects.

This study will provide valuable initial input for PREPA and the project developers of renewable generation and battery energy storage resources as it will give them a better understanding of the order of magnitude scope and cost for the interconnection of the proposed projects. For purposes of determining the necessary modifications of the interconnection facilities and network limitations, the Feasibility Study shall consider the technical details provided by the developers of proposed renewable generation and storage projects.

Stage 2: System Impact Study

The System Impact Study is a comprehensive analysis of the impact of adding the proposed renewable energy or energy storage project to the system. It provides an evaluation of their impact on the region of the grid where the renewable energy or energy storage project would be located. This study identifies the system constraints caused by the project and the necessary local and network upgrades to avoid these constraints. The analyses defines the scope for required upgrades of facilities. For purposes of determining the necessary modifications of the interconnection facilities and network upgrades, the System Impact Study shall consider the technical details provided by the developers of proposed renewable generation and storage projects. The System Impact Study includes power flow analysis, short circuit analysis, and stability analysis.

Stage 3: Facilities Study

During the Facilities Study stage, the System Impact Study results are used as necessary to identify the changes to the power grid. This stage explores the options for removing the constraints based on the findings of the analyses performed during the previous stages. The Facilities Study will determine the upgrades that will be necessary to remove thermal, short circuit, and stability constraints, including complementary equipment and modifications to accommodate those upgrades. When concluded, the Facilities Study will document the engineering design work identifying the measures that will be necessary to upgrade the interconnection facilities and will also provide a good faith estimate of the cost to be charged to the developer for the necessary local and network upgrades.

Typical Process Timeline in the United States

The proposed interconnection studies I have just described follow similar processes undertaken by large system operators for the interconnection of new generation, transmission and energy storage facilities; or the modification of existing facilities, throughout the United States. The following timeline is based on the one followed by PJM, one of the largest regional transmission organizations (RTO) in the United States.

Typical Interconnection Application and Study Process Duration: 26 months

1. *New Service Customers submit & PJM receives New Service Request: 6 months*
2. *Scoping Meeting & System Model: 1 month*
3. *PJM Completes Feasibility Studies: 3 Months*
4. *Developer Opportunity Window to Terminate and Withdraw Project: 1 month*
5. *Developer Executes System Impact Study Agreement → Model Build: 2 months*
6. *PJM Completes System Impact Studies: 4 Months*
7. *Terminate and Withdraw Project or Customer Executes Facility Study Agreement: 1 month*
8. *PJM Complete Facility Studies (varies by complexity): 6 months*
9. *Developer Opportunity Window to Terminate and Withdraw Project: 2 months*

PREPA RFP Timeline Considerations

PREPA's Experience with Shovel Ready Projects

In 2020 PREPA devoted substantial time and resources to the negotiation of power purchase and operating agreements (PPOAs) with developers of numerous renewable energy projects. The process included Non-Operating ("Shovel-Ready") Projects and renegotiation of agreements with projects currently in operation (Operating Projects). During this negotiation process Sargent & Lundy evaluated the grid interconnection feasibility of the Non-Operating Projects and the Operating Projects seeking to increase their capacity. For the Non-Operating Projects, the evaluations included:

- (i) Performing preliminary feasibility analysis that included power flow studies to evaluate the thermal impacts of the projects on the grid, and evaluation of Short Circuit Ratio (SCR)¹ requirements (this is not the regular short circuit analysis). No System Impact Study was developed. *Task (i) Duration: approximately 3 months*
- (ii) developing conceptual interconnection scope; and
- (iii) cost feasibility study preparing AACE² level 5 cost estimates for the planned interconnections. No full Facilities Study was developed. *Task (ii) & Task (iii) Duration: approximately 3 months total*

The analysis included the following facilities:

- 19 Non-Operating Projects (759 MW approx.)
- 7 Operating Projects uprating their contracted generating capacity (additional 54 MW approx.)

Based on PREPA's and Sargent & Lundy's experience in performing the Shovel Ready projects work, an estimated timeline assuming 20 projects are evaluated should assume as a minimum:

Stage 1: Feasibility Study – 3 to 4 months

Stage 2: System Impact Study – 6 to 8 months

Stage 3: Facilities Study – 3 to 4 months

THAT the described interconnection studies will need to be completed in order to support the initial selection of renewable generation and battery energy storage projects and the determination of the necessary network upgrades.

THAT the Feasibility Study will need to be performed as part of the process to enable PREPA to short-list candidate projects and assess the preliminary impacts of interconnecting those projects and integrating them into the PREPA system.

¹ Short Circuit Ratio (SCR) is a metric to determine the relative strength of a grid. It is defined as the ratio between short circuit apparent power of the system at the point of interconnection and the power of the project connected to that location. This metric does not evaluate the short circuit level at each location of the system and the impact in the electrical equipment, which is done with the short circuit analysis.

² This acronym refers to the Association for the Advancement of Cost Engineering, which publishes standards for cost estimating.

THAT the System Impact Study and Facilities Study are essential to determine the responsibility of the renewable energy generation and energy storage project developers to design, procure and install all the equipment necessary to interconnect and integrate the new generating or energy storage facility.

THAT these studies are crucial to mitigate potential equipment and network problems and limitations, and therefore to maintain system stability and reliability.

THAT these studies will identify the necessary power grid enhancements and determine the entity that should be responsible for these modifications, reducing technical and financial risks for PREPA.

THAT according to the latest Energy Bureau Resolution and Order in Case No. NEPR-MI-2020-0012, specifies that the RFP response evaluation process should last no longer than 45 days. Based on the timelines described for a typical interconnection process followed by large system operators in the United States, and the experience PREPA and Sargent & Lundy had in evaluating interconnection impacts associated with the Non-Operating Projects and Operating Projects in Puerto Rico, it is not possible to plan and perform the required interconnection studies (stages 1, 2 and 3) in the required 45-day proposal evaluation period. A final determination as to the feasibility and cost of interconnecting individual renewable generation and battery energy storage projects to the PREPA grid will have to await the completion of the necessary Feasibility, System Impact and Facilities Studies, which is likely to take between 12 and 16 months. Neither PREPA nor the project developer will have a sound basis on which to execute a power purchase and operating agreement or energy storage services agreement which incorporates anticipated interconnection costs and assigns responsibility for their payment until these studies have been completed.

The foregoing opinions are based upon my experience as set out above. In the preparation of this affidavit, I have made such inquiries as I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Energy Bureau.

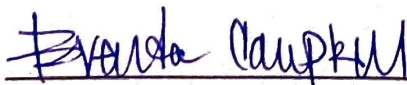
Executed in Chicago, Illinois on this 23rd day of December 2020.



Juan Diego Galvez Andia

State of Illinois
County of Cook

Signed and attested before me on this 23rd
day of December 2020 by Juan Diego Galvez Andia.



Signature of Notary Public

Signature of Notary Public

5

