Generation Interconnection

Combined Feasibility / Impact Study Report

for

Queue Project AG1-113

SOMERSET WINDPOWER 22.86 KV

3.6 MW Capacity / 0 MW Energy

January 2021

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1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Mid-Atlantic Interstate Transmission, LLC (MAIT) (PENELEC Zone).

2 Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

3 General

The Interconnection Customer (IC) has proposed an uprate to a planned/existing Storage generating facility located in Somerset, Pennsylvania. This project is an increase to the Interconnection Customer's AE1-116 project, which will share the same point of interconnection. The AG1-113 queue position is a 0 MW uprate (3.6 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 9 MW with 9 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is June 01, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-113
Project Name	SOMERSET WINDPOWER 22.86 KV
State	Pennsylvania
County	Somerset
Transmission Owner	MAIT (PENELEC)
MFO	9
MWE	0
MWC	3.6
Fuel	Storage
Basecase Study Year	2024

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

4 Point of Interconnection

AG1-113 will interconnect with the PENELEC system via a tap on the 23 kV Friedens circuit at pole # 2732112. The IC's proposed generating unit site is approximately 5.6 miles southeast of Somerset, PA., near 654 Beachley Hill Road.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-113 generation project to connect to the Penelec distribution system.

5 Cost Summary

The AG1-113 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$0
Total System Network Upgrade Costs	$0
Total Costs	$0

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 2016-36, 2016-25 I.R.B. (6/20/2016). If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

6 Transmission Owner Scope of Work

AG1-113 will interconnect with the PENELEC system via a tap on the 23 kV Friedens circuit at pole # 2732112. The IC's proposed generating unit site is approximately 5.6 miles southeast of Somerset, PA., near 654 Beachley Hill Road.

There is no work required for the AG1-113 project.

The total physical interconnection costs is given in the table below:

Description	Total Cost
Total Physical Interconnection Costs	$0

7 Schedule

There is no schedule required for the AG1-113 project.

8 Transmission Owner Analysis

There was no analysis required for the AG1-113 project.

9 Interconnection Customer Requirements

There are no changes to the existing requirements for the AG1-113 project.

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Section 8 of Attachment O.

10.2 Interconnected Transmission Owner Requirements

The IC will be required to comply with all Interconnected Transmission Owner's revenue metering requirements for generation interconnection customers located at the following link:

http://www.pjm.com/planning/design-engineering/to-tech-standards/

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-113 was evaluated as a 0.0 MW (Capacity 3.6 MW) injection as an uprate to E13, K22 & AE1-116 which is a direct connection at the Somerset 23 kV substation in the PENELEC area. Project AG1-113 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-113 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

11.2 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

11.3 Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

11.4 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
166142182	200744	26SOMERST	115.0	PENELEC	965880	AG1-457 TAP	115.0	PENELEC	1	Base Case	operation	148.0	99.72	100.18	DC	0.69
166141976	200746	26ROCKWOOD	115.0	PENELEC	965880	AG1-457 TAP	115.0	PENELEC	1	Base Case	operation	148.0	123.6	124.76	DC	1.71
166141947	965880	AG1-457 TAP	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	Base Case	operation	148.0	123.53	124.69	DC	1.71
166142132	965880	AG1-457 TAP	115.0	PENELEC	200746	26ROCKWOOD	115.0	PENELEC	1	Base Case	operation	148.0	99.65	100.11	DC	0.69

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

None

11.6 Flow Gate Details

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

None

11.7 Queue Dependencies

None

11.8 Contingency Descriptions

None

12 Light Load Analysis

Not Required

13 Short Circuit Analysis

The following Breakers are overdutied:

None

14 Stability Analysis

Will be performed in the Facilities Study phase.

15 Affected Systems

15.1 NYISO

NYISO Impacts to be determined during later study phases (as applicable).

15.2 MISO

MISO Impacts to be determined during later study phases (as applicable).

16 Attachment 1: One Line Diagram