Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-260

SUNBURY-DALMATIA 69 KV

8.3 MW Capacity / 19.9 MW Energy

Revised: February 2021

First Issued: 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 PPL.

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 Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

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 Revision History

This report revises the January 2021 report to include violations and reinforcement identified by the Transmission Owner. Please refer to Section 8 and Section 11.5 for details.

4 General

The Interconnection Customer (IC), **BAI Group, LLC**, has proposed an uprate to a planned Solar generating facility located in Northumberland County, Pennsylvania. This project is an increase to the Interconnection Customer's AG1-259 project, which will share the same point of interconnection. The AG1-260 queue position is a 19.9 MW uprate (8.3 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 39.8 MW with 16.6 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is August 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-260
Project Name	SUNBURY-DALMATIA 69 KV
State	Pennsylvania
County	Northumberland
Transmission Owner	PPL
MFO	39.8
MWE	19.9
MWC	8.3
Fuel	Solar
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.

5 Point of Interconnection

AG1-260 will interconnect with the PPL transmission system via the Sunbury - Dauphin 69 kV line, 5.76 miles from the Sunbury Yard 1 bus and 8.0 miles from the Dalmatia Tap bus. The Point of Interconnection (POI) will be at the PPL EU owned termination structure where the Interconnection Customer's transmission line terminates (with insulators).

6 Cost Summary

The AG1-260 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 0[1]
Total System Network Upgrade Costs	$ 27,000,000
Total Costs	$ 27,000,000

[1] It is assumed that the costs for the physical interconnection will be borne by the AG1-259 project. The estimate for the physical interconnection cost is captured in the AG1-259 study report on the PJM website.

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 88-129. 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.

7 Transmission Owner Scope of Work

None. The cost for the physical interconnection will be borne by the AG1-259 project.

8 Transmission Owner Analysis

PPL identified the following violation:

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CONT NAME	Type	Contingency Definition
167754467	208109	SUNB	PPL	200021	SUNBURY	PPL	PL:08:P42:001375	Breaker	CONTINGENCY 'PL:08:P42:001375' /* SUNB-SUSQ 1 230KV; SUSQ1 CB @ SUNB 230KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 25 /* SUNB TR25 DISCONNECT BRANCH FROM BUS 208109 TO BUS 208113 CKT 1 /* SUNB-SUSQ DISCONNECT BRANCH FROM BUS 208109 TO BUS 212441 CKT 23 /* SUNB TR23 END

This violation will be evaluated in the System Impact Study and the AG1-260 project's cost allocation will be provided in the System Impact Study report.

9 Interconnection Customer Requirements

PPL EU applicable technical standards that address requirements for interconnection of generation, transmission, and end user facilities can be found at the following link:

https://pjm.com/planning/design-engineering/to-tech-standards/private-ppl.aspx

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 Meteorological Data Reporting Requirements

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Temperature (degrees Fahrenheit)
- Atmospheric pressure (hectopascals)
- Irradiance
- Forced outage data

10.3 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 AG1-260 was evaluated as a 19.9 MW (Capacity 8.3 MW) injection as an uprate to AG1-259 which is tapping the 69 kV Sunbury - Dauphin Line in the PPL area. Project AG1-260 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-260 was studied with a commercial probability of 53.0 %. 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.

None

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Facility	Upgrade Description	Cost
R-PL-0026	208109 SUNB 230.0 kV - 200021 SUNBURY 500.0 kV Ckt Id 24 208109 SUNB 230.0 kV - 200021 SUNBURY 500.0 kV Ckt Id 25	Re-terminate the SUNB 500/230 kV Transformers at Sunbury into double breaker double bus arrangement in the 500kV yard. In the SUNB 230kV yard, re-terminate T24 into a breaker and half position with the SUNB-ELIM line and make the T25 bay double breaker double bus arrangement.	$27,000,000
		TOTAL COST	**$27,000,000**

12 Short Circuit Analysis

The following Breakers are overdutied:

None

12.1 System Reinforcements - Short Circuit

None

13 Affected Systems

13.1 NYISO

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

14 Attachment 1: One Line Diagram