Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-290

WAGNER 115 KV

4 MW Capacity / 20 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 BGE.

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 a Storage generating facility located in Baltimore County, Maryland. The installed facilities will have a total capability of 20 MW with 4 MW of this output being recognized by PJM as Capacity. The AG1-290 project is claiming Capacity Interconnection Rights (CIRs) from the retired Wagner Unit 2 generating facility. The proposed in-service date for this project is October 31, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-290
Project Name	WAGNER 115 KV
State	Maryland
County	Baltimore County
Transmission Owner	BGE
MFO	20
MWE	20
MWC	4
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

AG1-290 will interconnect with the BGE transmission system at the Wagner 115 kV Substation.

5 Cost Summary

The AG1-290 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$1,250,000
Total System Network Upgrade Costs	$0
Total Costs	$1,250,000

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

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

Description	Total Cost
Dead End UG Riser Pole w/Terminations & Arrestors	$500,000
Dead End Structure, Manual Operated Disconnect	$250,000
115kV UG Transmission Cable	$200,000
Overhead Conductoring	$75,000
Relay Installation/Modifications	$225,000
Total Physical Interconnection Costs	$1,250,000

7 Schedule

Based on the extent of the BGE Attachment and Non-Direct Connection work required to support the AG1-290 generation project, it is expected to take approximately **24-36-months** from the date of a fully executed Interconnection Construction Service Agreement to complete the installation.

8 Interconnection Customer Requirements

The Interconnection Customer (IC) is responsible for all design and construction related to activities on their side of the Point of Interconnection. Site preparation, including grading and an access road, as necessary, is assumed to be by the IC. Route selection, line design, and right-of way acquisition of the direct connect facilities is not included in this report and is the responsibility of the IC. The Interconnection Customer will be responsible for future O & M costs associated with the direct connect facilities.

Protective relaying and metering design and installation must comply with BGE's applicable standards. The IC is also required to provide revenue metering and real-time telemetering data to PJM in conformance with the requirements contained in PJM Manuals M-01 and M-14 and the PJM Tariff. BGE will require the capability to remotely trip the generator from its System Operations facility.

It is the IC's responsibility to send the data that both PJM and BGE require directly to PJM. The IC will grant permission for PJM to send BGE the following telemetry that the IC sends to PJM: real time MW, MVAR, volts, amperes, generator status, interval MWH and MVARH, and generator breaker position.

The IC is responsible for coordinating with BGE to ensure the revenue metering equipment is capable of being remotely interrogated by BGE's Automated Meter Reading system

9 Revenue Metering and SCADA Requirements

9.1 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.

9.2 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/

10 Summer Peak - Load Flow Analysis

The Queue Project AG1-290 was evaluated as a 20 MW (Capacity 4 MW) injection at the Wagner 115 kV Substation in the BGE area. The project was studied as claiming CIRs from the retired Wagner Unit 2 Facility. The AG1-290 project was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-290 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

10.1 Generation Deliverability

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

None

10.2 Multiple Facility Contingency

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

None

10.3 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

10.4 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

10.5 System Reinforcements - Summer Peak Load Flow - Primary POI

None

11 Short Circuit Analysis

The following Breakers are overdutied:

None

11.1 System Reinforcements - Short Circuit

None

12 Affected Systems

None