Generation Interconnection

Combined Feasibility / Impact Study Report

for

Queue Project AG1-086

FINDLAY 23 KV

10.5 MW Capacity / 17.5 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 DL.

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.

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3 General

The Interconnection Customer (IC), has proposed a Solar; Storage generating facility located in Allegheny County, Pennsylvania. The installed facilities will have a total capability of 17.5 MW with 10.5 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2020. This study does not imply a TO commitment to this in-service date.

Attachment facilities and local upgrades (if required) along with terms and conditions to interconnect AG1-086 will be specified in a separate two party Interconnection Agreement (IA) between DL and the Interconnection Customer as this project is considered FERC non-jurisdictional per the PJM Open Access Transmission Tariff (OATT). From the transmission system perspective, no network impacts were identified in the Combined Feasibility/Impact Study.

Queue Number	**AG1-086**
Project Name	FINDLAY 23 KV
State	Pennsylvania
County	Allegheny
Transmission Owner	DL
MFO	17.5
MWE	17.5
MWC	10.5
Fuel	Solar; 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.

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4 Point of Interconnection

AG1-086 will interconnect with the DL distribution system at the Findlay 23 kV bus.

5 Cost Summary

The AG1-086 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	To be Provided by DL in the Distribution Impact Study
Total System Network Upgrade Costs	$0
Total Costs	To be Provided by DL in the Distribution Impact Study

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.

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6 Transmission Owner Scope of Work

Detailed scope, cost, and schedule will be provided in a separate two party Interconnection Agreement (IA) between DL and the Interconnection Customer.

Description	Total Cost
Total Physical Interconnection Costs	To be Provided by DL in the Distribution Impact Study
Total System Network Upgrade Costs	$0
Total Costs	To be Provided by DL in the Distribution Impact Study

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7 Interconnection Customer Requirements

Duquesne Light Company's "Facility Interconnection Requirements" document dated 12/30/2015: http://www.pjm.com/planning/design-engineering/to-tech-standards/private-duquesne.aspx

8 Revenue Metering and SCADA Requirements

8.1 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.

8.2 Meteorological Data Reporting Requirements

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

- Back Panel temperature (Fahrenheit) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter2) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) - (Accepted, not required)
- Wind direction (decimal degrees from true north) - (Accepted, not required)

8.3 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/

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9 Summer Peak - Load Flow Analysis

The Queue Project AG1-086 was evaluated as a 17.5 MW (Capacity 10.5 MW) injection at the Findlay 138 kV substation in the DL area. Project AG1-086 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-086 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

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9.1 Generation Deliverability

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

None

9.2 Multiple Facility Contingency

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

None

9.3 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

9.4 Steady-State Voltage Requirements

To be determined by DL

9.5 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

9.6 System Reinforcements

None

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10 Short Circuit Analysis

The following Breakers are overdutied

None

11 Stability and Reactive Power Assessment

(Summary of the VAR requirements based upon the results of the dynamic studies)

Not required

12 Light Load Analysis

Light Load Studies (As applicable)

Not required

13 Affected Systems

None

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