AEP Portion of
Facilities Study Report
For
Physical Interconnection of
PJM Generation Interconnection Request
Project ID AF2-376

"Timber Switch 138 kV"

Revision 0: May 2024

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff, as well as the Application and Studies Agreement between the Project Developer and PJM Interconnection, LLC (PJM or Transmission Provider (TP)). The Transmission Owner (TO) is AEP Ohio Power Company, to be abbreviated in the remainder of this report as OHPCo.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a Storage uprate to an existing Wind Generating Facility located in Paulding County, Ohio.

The AF2-376 project is a 50 MW uprate (20 MW Capacity uprate) to the R49 project, connecting to the AEP Timber Switch 138 kV Station. The total installed facilities will have a capability of 200 MW with 50 MW of this output being recognized by PJM as Capacity.

2. POINT OF CHANGE IN OWNERSHIP

The Point of Interconnection (POI) is the point where the risers connect the generator lead circuit to the Timber Switch 138 kV Station line termination point. The AF2-376 project is an uprate to the Project Developer's R49 project and will share the same Point of Change in Ownership (PCO).

3. AMENDMENTS TO THE IMPACT STUDY DATA OR IMPACT STUDY RESULTS

No amendments to the impact study data or impact study results are required by AEP.

4. PROJECT DEVELOPER SCHEDULE

The Project Developer's requested in-service date for the generation facility is N/A.

This report does not imply a Transmission Owner commitment to this date.

5. SCOPE OF PROJECT DEVELOPER FACILITIES

The Project Developer will design, build, own, operate, and maintain the Project Developer Interconnection Facilities on the Project Developer's side of the Point of Change in Ownership (PCO). This includes, but is not limited to:

- Main power transformer (MPT) transformer(s)
- Circuit breakers and associated equipment located between the high side of the MPT and the Point of Change in Ownership
- Relay and protective equipment, and Supervisory Control and Data Acquisition (SCADA) and telecommunications equipment to comply with the TO's Applicable Technical Requirements and Standards
- **Instrument transformers required to provide revenue quality metering and settlement between the AF2-376 project and any previous/originating projects interconnecting behind the same Point of Change in Ownership.**

- **Additional cable connections required between the below-proposed ethernet switch (to be installed at the AF2-376 project collector station) and the primary router (either installed or to be installed at the originating project collector station) for metering data transport.**

B. Transmission Owner Facilities Study Results

The following is a description of the Transmission Owner facilities required for physical interconnection of the AF2-376 project to the AEP transmission system. These facilities shall be designed according to AEP standards. Once built, AEP will own, operate, and maintain these Facilities.

1. INTERCONNECTION SUBSTATION (TIMBER SWITCH)

- OHPCo will review and revise (as necessary) the protective relay settings at the Timber Switch 138 kV Station to account for the additional generation.

2. TRANSMISSION LINE TIE-IN

No Transmission Line Tie-In work will be required for this project.

3. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

- OHPCo will install one (1) metering plate and one (1) ethernet switch in the AF2-376 Project Developer's collector station.
- OHPCo will one (1) connected grid router (CGR) in the Project Developer's originating project collector station.

4. UPGRADE TO NEIGHBORING STATIONS

No Upgrades will be required at Neighboring AEP Stations.

5. INSTALLATION OF FIBER CABLE CIRCUITS

No new AEP fiber cable circuits will be required for this project.

6. COST ESTIMATE OF AEP FACILITIES FOR PHYSICAL INTERCONNECTION

The following tables summarize the total estimated costs according to FERC criteria. The estimated costs are in 2024 dollars. **This cost excludes Federal Income Tax Gross Up charges on Contributions in Aid of Construction (CIAC).** 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 charges are required, the Transmission Owner shall be reimbursed by the Project Developer for such taxes. The estimated reimbursement amount is noted in the table below.

6.1 COST ESTIMATE FOR TRANSMISSION OWNER-BUILD OPTION

Work Description	Type of Upgrade	Direct		Indirect		Total	Tax
		Labor	Material	Labor	Material		
Transmission Owner Interconnection Facilities	TOIF	$106,608	$51,442	$23,199	$12,553	$193,802	$0
New Interconnection Substation	Stand Alone	$0	$0	$0	$0	$0	$0
Expansion of existing substation	non-Stand Alone	$36,901	$7,080	$14,081	$2,702	$60,764	$0
Interconnection Substation tie-in	non-Stand Alone	$0	$0	$0	$0	$0	$0
Remote relay at substation x	non-Stand Alone	$0	$0	$0	$0	$0	$0
Remote relay at substation y	non-Stand Alone	$0	$0	$0	$0	$0	$0
Fiber Installation in Existing ROW	non-Stand Alone	$0	$0	$0	$0	$0	$0
Fiber Installation in New ROW	Stand Alone	$0	$0	$0	$0	$0	$0
Final Tie in for Fiber installation in New ROW	non-Stand Alone	$0	$0	$0	$0	$0	$0
Total Project Costs		**$143,509**	**$58,522**	**$37,280**	**$15,255**	**$254,566**	**$0**

7. MILESTONE SCHEDULES FOR COMPLETION OF AEP WORK

7.1 STANDARD OPTION:

Activity	Number of Days (See Notes)
Project Engagement*	1
Engineering Start	45
Material Ordering	N/A
Construction (Grading & Below Grade)	N/A
Construction (Above Grade)	N/A
Outage Requests Made By	N/A
Outage (Structure Foundations)**	N/A
Outage (Cut-in & Testing)**	N/A
Ready For Back Feed (ITO In-Service Date)	105

***Day 1 will be determined at the PJM construction project kick off meeting.**

The above schedule is based on typical AEP labor timelines. The facilities outlined in this report, as constructed by AEP, are estimated to take 3 months to complete. Given this timeline and a typical period for agreement processing, AEP can support a backfeed date of November 11, 2024, subject to change during the tariff defined Final Agreement Negotiation Phase.

8. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

8.1 SCOPE ASSUMPTIONS:

- Protection and Control (P&C) coordination with the Project Developer will be needed throughout the project. The Project Developer will be required to install an AEP-compatible line relaying protection panel at the collector substation using AEP standards to ensure relay coordination and adequate line protection. The AEP design team will ensure that the firmware at the collector station terminal matches the approved firmware at the AEP terminal. Failure to accept the cost of a matching line relay protection panel may change scoping.
- Scopes provided are based on a table-top process without the benefit of the results of site-specific engineering studies (e.g., soil borings, environmental survey, ground grid, etc.), unless otherwise provided by the Project Developer.
- The Project Developer will have their construction and required checkout complete prior to the energization of the AF2-376 uprate to the R49 project and any required testing outages.

8.2 SCHEDULE ASSUMPTIONS:

- All transmission outages are subject to PJM and AEP Operations outage scheduling requirements.
- Significant scope of work changes will impact the schedule.
- The above schedule reflects only the work required to interconnect the AF2-376 project. The schedules regarding network upgrades associated with this project, if any, are detailed in the documentation related to the specific network upgrade.
- Slippage by the Project Developer in executing the Generation Interconnection Agreement (GIA) does not equate to a "day for day" slippage in the scheduled back feed and in service dates. Depending on the time of year, planned outages, neighboring projects and maintenance of the grid, outage availability has the potential to shift by weeks or months depending on conditions at the time of the fully executed agreement.

8.3 ESTIMATE ASSUMPTIONS:

- Estimates provided are based on a table-top process without the benefit of the results of site-specific engineering studies (e.g., soil borings, environmental survey, ground grid, etc.), unless otherwise provided by the Project Developer.

9. METERING REQUIREMENTS

All metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AF2-376 GIA, and in PJM Manuals M01 and M14D. The details of applicable metering requirements are provided in the "Connection Requirements for the AEP Transmission System" document, found at:
https://www.aep.com/requiredpostings/AEPTransmissionStudies

The primary metering will be installed on the Transmission Owner side of the Point of Change in Ownership and will be owned and maintained by the Transmission Owner.

Any additional generation proposed behind an originating project's PCO that differs in either type or corporate entity from the originating project will require the installation of additional submetering for both the originating project and the uprate for the purpose of settlement. Submetering will require additional space within the originating project's facilities. The meters, routers, Ethernet to fiber converters, and telecom switch will be procured and owned by AEP. The revenue quality instrument transformers, fiber-optic cable connecting the submeters, and any other additional hardware for the required submetering will be procured, installed, owned, and maintained by the Project Developer.

10. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

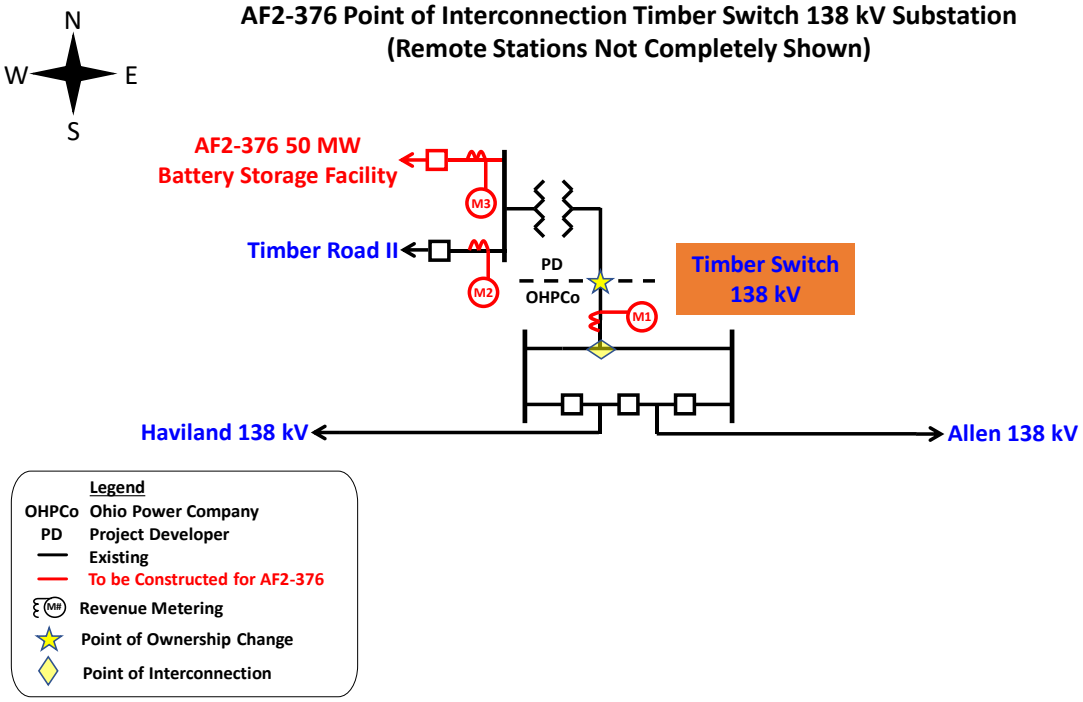
Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the https://www.aep.com/requiredpostings/AEPTransmissionStudies posted on AEP website.

11. ENVIRONMENTAL AND PERMITING

The Project Developer is expected to obtain, at its cost, all necessary permits and provisions for the facilities to be constructed for this interconnection. AEP requires that the standards provided in the "Standards and Expectations for Siting, Real Estate, Right-Of-Way, and Environmental Permitting for Transmission Interconnection Projects", found at: https://www.aep.com/requiredpostings/AEPTransmissionStudies be adhered to for all facilities interconnecting with the AEP transmission system.

C APPENDICES

Attachment #1: Single line Diagram for the Physical Interconnection



Attachment #2: POI Map