Generation Interconnection

Facilities Study Report

for

Queue Project AB2-085

Adams 138 kV

Adams County, OH

July 2021

1 Facilities Study Summary

1.1 Project Description

Community Energy Solar Development, LLC (Community Energy) proposes to install PJM Project AB2-085, an 80.0 MW (54.4 MW Capacity) solar generating facility in Adams County, OH (Figure 2). The point of interconnection for the generating facility will be a direct connection to the Adams 138 kV substation (Figure 1).

The originally requested backfeed date for the project was: 04/01/2020.

The originally requested in-service date for the project was: 06/01/2020.

1.2 Amendments/Changes to the Impact Study Report

In the course of the Facilities Study, the project termination within the Adams station was relocated, due to obstructions near the station.

1.3 Interconnection Customer Schedule

PJM and AEP understand that the Interconnection Customer has established the following schedule dates:

Receive back feed power from AEP: 9/30/2022

Generation Commercial Operation Date: 12/30/2022

1.4 AEP's Scope of Work to Facilitate Interconnection

- To accommodate the interconnection at AEP's existing Adams (Ohio) 138 kV substation, the station will have to be expanded by adding one (1) 138 kV circuit breaker.
- Installation of associated protection and control equipment, 138 kV line risers, SCADA, and 138 kV revenue metering will also be required at 138 kV Adams substation. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.

- AEP will extend one span of 138 kV transmission line for the generation-leads going to the AB2-085 site. Unless this span extends directly from within the AEP station at the POI to the IC collector station structure, AEP will build and own the first transmission line structure outside of Adams substation, to which the AEP and AB2-085 transmission line conductors will attach.

- It is understood that the Interconnection Customer is responsible for all of the connection costs associated with interconnecting the PJM project AB2-085 to the AEP transmission system. The cost of the customer's generating facility and the costs for the line connecting the generating facility to AEP's transmission system (Beyond the first span exiting the POI station) are not included in this report; these are assumed to be the Customer's responsibility.

- The customer will be responsible for the cost of constructing a fiber-optic connection from their telecom equipment to AEP's Adams control house.

1.5 Description of Transmission Owner Facilities Included in the Facilities Study

1.5.1 Direct Connection Work

- AEP shall install one (1) additional 138 kV circuit breaker and one line connection for the IPP at Adams substation. The Adams 138 kV bus will be configured as a breaker and a half station. Installation of associated protection and control equipment, 138 kV line risers, SCADA, and 138 kV revenue metering will also be required (Figure 1).

- AEP shall install line protection and controls at the Adams 138 kV substation.

- Two 2 fiber connections are required. AEP will extend the fiber-optic cables from the points of transition into the Adams control house. The customer will be responsible for the fiber work on the IPP side of the points of transition.

1.5.2 Non-Direct Connection Work

1.5.3 Attachment Facilities Work

- Install 138 kV revenue metering at Adams 138 kV substation.

- AEP will extend one span of 138 kV transmission line for the generation-lead going to the AB2-085 site. AEP will build and own the first transmission line structure outside of Adams substation, to which the AEP and AB2-085 transmission line conductors will attach.

1.5.4 Network Upgrade Work

No AEP facility upgrades will be needed.

1.6 Total Cost of Transmission Owner Facilities Included in the Facilities Study:

Attachment Facilities	$1,119,830
Direct Connection Facilities	$1,243,667
Non-Direct Connection Facilities	$0
Network Upgrade Facilities	$0
Total Cost	$2,363,497

The estimates do not include the impact that delays in obtaining ROW, permits, or other approvals may have.

1.7 Summary of Schedule Milestones for Completion of Transmission Owner Work Included in Facilities Study:

Standard Process

Task	Dates
Engineering Start	Q3 2021
Material Ordered	Q4 2021
Construction Start (Grading & Below Grade)	Q3 2022
Construction Start (Above Grade)	Q3 2022
Outage Requests Made By	Q1 2022
Outage (Structure Foundations)	Q3 2022
Outage (Cut-in & Testing)	Q4 2022
Ready For Back Feed	10-30-2022
In-Service Date	12-15-2022

Assumptions (Standard Process)

- **ISA and ICSA executed by 06-30-2021**
- **System conditions must allow scheduled outages to occur.**
- **The customer will obtain, at its' cost, all necessary provisions for the AEP direct connection facilities.**
- **The customer will perform site development and road construction in accordance with AEP specifications.**

- **The customer will provide site acceptable to AEP (for transfer to AEP in Fee Simple) and any additional easements for 138 kV station and line work to include access to all facilities and structures.**
- **The customer will have their construction and required checkout completed prior to the start of the cut-in and testing outage.**

Transmission Outage Plan

No transmission outage plan has been specified at this time

2 *Transmission Owner Facilities Study Results

2.1 Transmission Lines – New

AEP will extend one span of 138 kV transmission line for each generation lead going to the AB2-085 site from the Adams substation. AEP will build and own the first transmission line structure outside of the Adams substation, to which the AEP and AB2-085 transmission line conductors will attach.

2.2 Transmission Lines – Upgrades

None

2.3 Substation Facilities – New

None

2.4 Substation Facilities – Upgrades

AEP will need to expand the existing Adams (Ohio) station to facilitate the connection of the generation lead going to the PJM project AB2-085. To accomplish this One (1) additional 138 kV circuit breaker will be installed. Installation of associated protection and control equipment, 138 kV line risers, SCADA, and 138 kV revenue metering will also be required (Figure 1).

2.5 Metering & Communications

Standard 138 kV metering will be installed at Adams substation. A standard station communication scheme will be used. All metering equipment shall meet the requirements as specified by AEP in the "AEP Metering and Telemetering Requirements for AEP Transmission Customers" document (SS-490011). Communication requirements are published in the "AEP SCADA RTU Requirements at Transmission Interconnection Facilities" (SS-500000).

The Generation Interconnection Agreement does not in or by itself establish a requirement for American Electric Power to provide power for consumption at the developer's facilities. A separate agreement may be reached with the local utility that provides service in the area to ensure that infrastructure is in

place to meet this demand, and proper metering equipment in installed. The metering work above and cost indicated below does not include any potential work or cost to address metering requirements of the local service provider. It is the responsibility of the developer to contact the local service provider to determine if a local service agreement is required.

2.6 Environmental, Real Estate, and Permitting issues

The Interconnection customer is expected to obtain, at its' cost, all necessary permits and provisions for the IPP station connecting to Adams 138 kV.

2.6.1 System Modeling & Operating Requirements

In addition to the IPP modeling requirements imposed by PJM as part of the Generation Interconnection process, the following system modeling parameters will need to be supplied by the Interconnection Customer to AEP:

- None

2.7 Summary of Results of Study

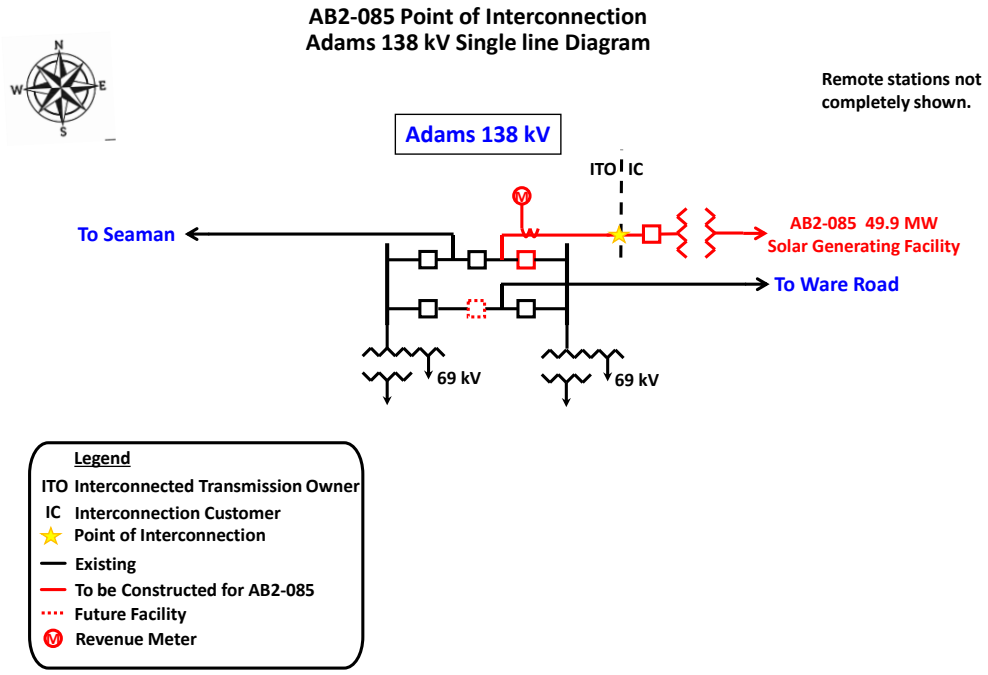
Cost Estimates for AEP

Task	Network Upgrade Number	Engineering	Material	Construction	Other	TOTAL
Expand Adams 138 kV Substation with required line protection and controls	**n5422**	$103,300.67	$494,363.67	385,415.67	$260,587.00	$1,243,667.00
138 kV Revenue Metering	**n5422**	$31,428.00	$125,552.00	$163,400.00	$83,217.00	$403,597.00
Fiber Extension	**n7281**	$10,466.33	$14,346.33	$76,884.33	$22,135.00	$123,832.00
Exit Span	**n7280**	$96,013.00	$119,889.00	$240,138.00	$136,361.00	$592,401.00
TOTAL		$241,208.00	$754,151.00	$865,838.00	$502,300.00	$2,363,497.00

2.8 Information Required for Interconnection Service Agreement

Description	DCF Facility	Attachment Facility	TOTAL
Direct Material	$494,363.67	$259,787.33	$754,151.00
Direct Labor	$488,716.33	$618,329.67	$1,107,046.00
Indirect Material	$131,041.98	$71,582.17	$202,624.15
Indirect Labor	$129,545.02	$170,130.83	$299,675.85
TOTAL	$1,243,667.00	$1,119,830.00	$2,363,497.00

Figure 1: Point of Interconnection (Adams 138 kV) One-Line Diagram



The Point of Interconnection ("POI") is at the first (dead-end) structure outside the Adams 138 kV station fence. AEP owns the span from the Adams 138kV station to the Dead-end, including the jumpers and structure at the Dead-end. Community Energy owns the span connecting to the POI, and the 138kV generator lead line and remaining structures back to the AB2-085 generation collector station.

Figure 2: Point of Interconnection Map