# Generation Interconnection

# Facilities Study Report

# For

# Queue Project AC2-111

# College Corner 138 kV

# Preble County, Ohio

**April 2021**

# 1 Facilities Study Summary

## 1.1 Project Description

Angelina Solar I, LLC proposes to install PJM Project AC2-111, an 80 MW (30.4 MW Capacity) solar generating facility in Preble County, Ohio (Figure 2). The point of interconnection for the generating facility will be a direct connection to AEP's College Corner 138 kV station, located in Union County, Indiana (Figure 1).

## 1.2 Amendments/Changes to the Impact Study Report

No significant amendments/changes noted.

## 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: Fall 2022

Generation Commercial Operation Date: December 2022

## 1.4 AEP's Scope of Work to Facilitate Interconnection

- To accommodate the interconnection at AEP's existing College Corner 138 kV station, the station will have to be expanded by adding two (2) 138 kV circuit breakers.

- Installation of associated protection and control equipment, 138 kV line risers, 138 kV switches, jumpers, SCADA and 138 kV revenue metering will be required at the College Corner 138 kV station. 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 AC2-111 site. AEP will build and own the first transmission line structure outside of the College Corner 138 kV station, to which the AEP and AC2-111 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 AC2-111 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 the College Corner 138 kV control house.

## 1.5 Description of Transmission Owner Facilities Included in the Facilities Study

### 1.5.1 Direct Connection Work

- AEP shall install two (2) additional 138 kV circuit breakers and one line connection for the IPP at the College Corner 138 kV station. The College Corner 138 kV station will be upgraded to a 12 circuit breaker, breaker and a half configuration.

- AEP shall install associated line protection and control equipment, 138 kV line risers, 138 kV switches, jumpers and SCADA at the College Corner 138 kV station.

- Two (2) fiber connections are required. AEP will extend the fiber-optic cables from the points of transition into the College Corner 138 kV control house. The customer will be responsible for the fiber work on the IPP side of the points of transition.

    - At the point of transition the fiber cables leading to the customer facilities will be installed as one OPGW path and one ADSS path.

### 1.5.2 Non-Direct Connection Work

- No Non-Direct Connection work will be required for this project.

### 1.5.3 Attachment Facilities Work

- AEP will Install 138 kV revenue metering at the College Corner 138 kV station.

- AEP will extend one span of 138 kV transmission line for the generation lead going to the AC2-111 site. AEP will build and own the first transmission line structure outside of the College Corner 138 kV station to which the AEP and AC2-111 transmission line conductors will attach.

### 1.5.4 Network Upgrade Work

No AEP facility upgrades will be needed.

***Due to system overloads found during the PJM studies, the following network reinforcements are required:***

- None

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

| | |
|---|---|
| Attachment Facilities | $865,654 |
| Direct Connection Facilities | $1,471,750 |
| Non-Direct Connection Facilities | $0 |
| Network Upgrade Facilities | $0 |
| Total Cost | $2,337,314 |

*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** | 2nd Quarter 2021 |
| **Material Ordered** | 3rd Quarter 2021 |
| **Construction Start (Grading & Below Grade)** | 2nd Quarter 2022 |
| **Construction Start (Above Grade)** | 2nd Quarter 2022 |
| **Outage Requests Made By** | 2nd Quarter 2021 |
| **Outage (Structure Foundations)** | 2nd Quarter 2022 |
| **Outage (Tie-in & Testing)** | 3rd Quarter 2022 |
| **Ready For Back Feed** | September 30, 2022 |
| **In-Service Date** | December 31, 2022 |

**Assumptions (Standard Process)**

- **ISA and ICSA executed by June 2021**
- **Estimates provided are based on a table top process without the benefit of site specific engineering studies (soil borings, environmental survey, etc.), unless otherwise provided by the interconnection customer.**
- **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 have their construction and required checkout completed prior to the start of the tie-in at the College Corner 138 kV station and associated testing outage.**

**Transmission Outage Plan**

No transmission outage plan has been specified at this time

# 2 Transmission Owner Facilities Study Results

## 2.2 Transmission Lines – New

- AEP will extend one span of 138 kV transmission line for the generation leads going to the AC2-111 site from the College Corner 138 kV station. AEP will build and own the first transmission line structure outside of the College Corner 138 kV station to which the AEP and AC2-111 transmission line conductors will attach.

## 2.3 Transmission Line – Upgrades

- No transmission line upgrades will be required for this project.

## 2.4 Station Facilities – New

- No new station facilities will be required for this project.

## 2.5 Station Facilities – Upgrades

- AEP will need to expand the existing College Corner 138 kV station to facilitate the connection of the generation lead going to the PJM project AC2-111. To accomplish this, two (2) additional circuit breakers will be installed. Installation of associated protection and control equipment, 138 kV line risers, 138 kV switches, jumpers, SCADA and 138 kV revenue metering will also be required (Figure 1).

- Due to the new generation source being added, nearby Protective relay settings for the remainder of the College Corner 138 kV station will be reviewed and updated (as needed) to account for the addition of the AC2-111 generation source.

## 2.6 Metering & Communications

Standard 138 kV metering will be installed at the College Corner 138 kV station. 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

shall be reached with the local utility that provides service in the area to ensure that infrastructure is in place to meet the power demand at the AC2-111 site and proper metering equipment is installed. The metering work identified in the cost estimates indicated below do not include any potential work or costs to address metering requirements of the local service entity provider. It is the developer's responsibility to contact the local service provider and obtain the local service agreement that is required prior to energization.

## 2.7 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 adjacent to the College Corner 138 kV station.

### 2.7.1 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

## 2.8 Summary of Results of Study

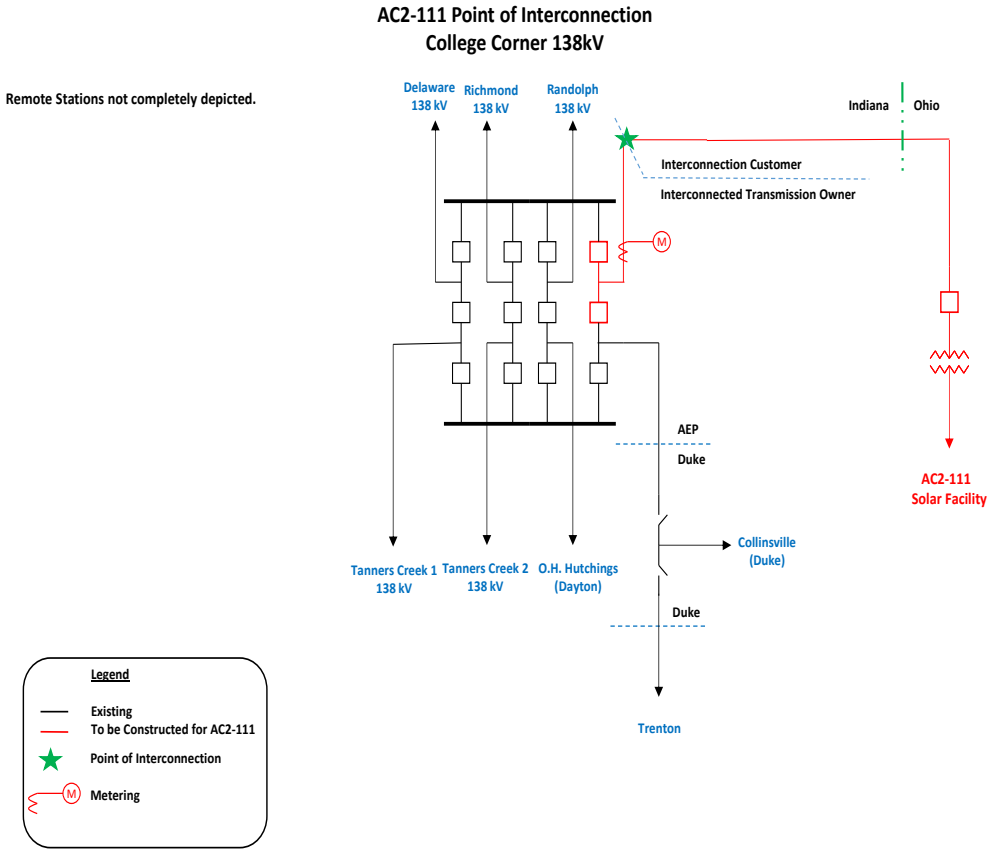
Cost Estimates for AEP

| Task | Network Upgrade Number | Engineering | Material | Construction | Other | TOTAL |
|---|---|---|---|---|---|---|
| **Install breakers and associated equipment at College Corner** | n6034 | $92,436 | $546,922 | $379,070 | $262,898 | **$1,281,326** |
| **Install Metering at College Corner** | n6035 | $26,651.67 | $122,292.67 | $61,979.67 | $62,239 | **$273,163** |
| **Install first structure outside College Corner** | n6035 | $96,013 | $119,889 | $240,138 | $136,361 | **$592,401** |
| **College Corner Fiber** | n6034 | $26,590.67 | $28,621.67 | $101,447.67 | $33,764 | **190,424** |
| **TOTAL** | | **$241,691.33** | **$817,725.33** | **$782,635.33** | **$495,262** | **$2,337,314** |

## 2.9 Information Required for Interconnection Service Agreement

| Description | DCF Facility | NUF Facility | ATF Facility | TOTAL |
|---|---|---|---|---|
| **Direct Material** | $546,922.00 | $0.00 | $270,803.33 | **$817,725.33** |
| **Direct Labor** | $471,506.00 | $0.00 | $552,820.67 | **$1,024,326.67** |
| **Indirect Material** | $141,182.98 | $0.00 | $78,102.65 | **$219,285.63** |
| **Indirect Labor** | $121,715.02 | $0.00 | $154,261.35 | **$275,976.37** |
| **TOTAL** | **$1,281,326.00** | **$0.00** | **$1,055,988.00** | **$2,337,314** |

## Figure 1: Point of Interconnection One-Line Diagram




The Point of Interconnection ("POI") is at the first (dead-end) structure north of the College Corner 138 kV station fence. AEP owns the span from the College Corner 138kV station to the dead-end, including the jumpers and structure at the dead-end. Angelina Solar I, LLC owns the span connecting to the POI, and the 138kV generator lead line and remaining structures back to the AC2-111 generation collector station.

Figure 2: Point of Interconnection Map