# *Generation Interconnection Feasibility Study Report Eastwood 34.5 kV*

## General

Interconnection Customer has proposed a 20 MW solar photovoltaic generating facility to be built near Bootjack Corner Road, Clermont County, Ohio; please refer to the Facilities Location map in Appendix 1. For the AC2-085 project, PJM recognizes 10.8 MW as Capacity Interconnection Rights. The proposed in-service date for this project is June 1, 2019. **This study does not imply a Duke Energy ("Transmission Owner") commitment to this in-service date.**

## Point of Interconnection

AC2-085 will interconnect with the Duke Energy distribution system by direct injection into Eastwood substation 34.5 kV bus. The Point of Interconnection is located where Duke Energy's overhead line from the new substation terminates to the Interconnection Customer's pole mounted switch, approximately 75 feet outside the Eastwood substation fence; please refer to the single-line diagram in Appendix 2.

An alternate Point of Interconnection (or Option #2 POI) is also proposed as direct injection into Eastwood substation 138 kV bus.

The impact of both POIs is studied and the results are presented in the network impacts section of this report. Please note that only costs associated with Option #1 POI are stated in this report.

## Network Impacts

## Option #1 Point of Interconnection

The Queue Project AC2-085 was evaluated as a 20.0 MW (Capacity 10.8 MW) injection at the Eastwood 34.5 kV substation in the DEOK area. Project AC2-085 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AC2-085 was studied with a commercial probability of 53%. Potential network impacts were as follows:

## Summer Peak Analysis - 2020

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

None

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

None

**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

**Steady-State Voltage Requirements**

To be determined at later study stage.

**Short Circuit**
*(Summary of impacted circuit breakers)*

None

## Affected System Analysis & Mitigation

### LGEE Impacts:

There are potential impacts in LGEE's area; the impacts will be determined during later study phases.

**MISO Impacts:**

There are potential impacts in MISO's area; the impacts will be determined during later study phases.

**OVEC Impacts:**

There are potential impacts in OVEC's area; the impacts will be determined during later study phases.

**Delivery of Energy Portion of Interconnection Request**

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.
Only the most severely overloaded conditions are listed. 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 will study all overload conditions associated with the overloaded element(s) identified.

None

# Light Load Analysis - 2020

Light Load Studies to be conducted during later study phases (as required by PJM Manual 14B).

# System Reinforcements

**Short Circuit**

None

**Stability and Reactive Power Requirement**

To be determined

## Summer Peak Load Flow Analysis Reinforcements

**New System Reinforcements**

*(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)*

None

**Contribution to Previously Identified System Reinforcements**

*(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)*

None

## Light Load Load Flow Analysis Reinforcements

**New System Reinforcements**
*(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)*

None

**Contribution to Previously Identified System Reinforcements**
*(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)*

None

## Network Impacts

## Option #2 Point of Interconnection

The Queue Project AC2-085 was evaluated as a 20.0 MW (Capacity 10.8 MW) injection at the Eastwood 138 kV substation in the DEOK area. Project AC2-085 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AC2-085 was studied with a commercial probability of 53%. Potential network impacts were as follows:

## Summer Peak Analysis - 2020

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

None

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

None

**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

**Steady-State Voltage Requirements**

To be determined at later study stage

**Short Circuit**
*(Summary of impacted circuit breakers)*

To be determined

## Affected System Analysis & Mitigation

### LGEE Impacts:

There are potential impacts in LGEE's area; the impacts will be determined during later study phases.

**MISO Impacts:**

There are potential impacts in MISO's area; the impacts will be determined during later study phases.

**OVEC Impacts:**

There are potential impacts in OVEC's area; the impacts will be determined during later study phases.

**Delivery of Energy Portion of Interconnection Request**

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.
Only the most severely overloaded conditions are listed. 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 will study all overload conditions associated with the overloaded element(s) identified.

None

# Light Load Analysis - 2020

Light Load Studies to be conducted during later study phases (as required by PJM Manual 14B).

# System Reinforcements

**Short Circuit**

None

**Stability and Reactive Power Requirement**

To be determined

## Summer Peak Load Flow Analysis Reinforcements

**New System Reinforcements**

*(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)*

None

**Contribution to Previously Identified System Reinforcements**

*(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)*
*(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)*

## Light Load Load Flow Analysis Reinforcements

### New System Reinforcements

*(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)*

None

### Contribution to Previously Identified System Reinforcements

*(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)*

None