# *Generation Interconnection*
# *Combined Feasibility/Impact Study Report*

***For***

# *PJM Generation Interconnection Request*
# *Queue Position AC2-170*

# *"Quarryville"*
# *1.1 MW Capacity / 0 MW Energy*

October 2017

# Preface

The intent of the Combined Feasibility and System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation, if any, is included in the System Impact Study.

The Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. Interconnection Customer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs associated with them will be addressed when seeking an Interconnection Agreement as outlined below. Interconnection Customer will also be responsible for providing and installing metering equipment in compliance with applicable PJM and Transmission Owner standards.

# General

Keystone Solar LLC, the Interconnection Customer (IC), has proposed an uprate to its solar generating facility located in the Lancaster County of Pennsylvania. Under the queue position V4-027, the IC proposed a project with capability of 5MW with 1.9 MW being recognized by PJM as Capacity. Subsequently, under queue position AC2-170, the IC proposed a 0 MW increase in capability and a 1.1 MW increase in the megawatts being recognized by PJM as capacity. The total combined capability of queue positions AC2-170 and V4-027 will be 5 MW, with 3 MW being recognized by PJM as capacity. The proposed in-service date for the AC2-170 project is March 2019. **This study does not imply a PPL EU commitment to this in-service date.**

## Point of Interconnection (POI)

The IC requested a distribution level interconnection. As a result, the queue position AC2-170 will interconnect with the PPL EU transmission network via the Buck 12 kV Line #08-2. The queue position AC2-170 POI is identical to the queue position V4-027 POI. The single line is shown in Attachment 1.

## Cost Summary

The AC2-092 project will be responsible for the following costs:

| Description | Total Cost |
|---|---|
| Attachment Facilities | $ 0 |
| Direct Connection Network Upgrades | $ 0 |
| Non Direct Connection Network Upgrades | $ 0 |
| **Total Costs** | **$ 0** |

## Attachment Facilities

There are no additional Attachment Facilities for the Transmission Owner required to support this uprate.

## Direct Connection Cost Estimate

There are no additional Direct Connection Facilities for the Transmission Owner required to support this uprate.

## Non-Direct Connection Cost Estimate

There are no additional Direct Connection Facilities for the Transmission Owner required to support this uprate.

## Interconnection Customer Requirements

Requirements for the customer facility can be found the in V4-027 study report.

## Revenue Metering and SCADA Requirements

### 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 Sections 24.1 and 24.2.

### Interconnected Transmission Owner Requirements

Requirements for the customer facility can be found the in V4-027 report.

# Network Impacts

The Queue Project AC2-170 was evaluated as a 1.1 MW capacity increase to Queue Project V4-027, connected at the Buck 69 kV substation in the PPL area. Project AC2-170 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AC2-170 was studied with a commercial probability of 100%. 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

## 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 System Impact Study)*

None

### Steady-State Voltage Requirements

None.

### Short Circuit

Not required because of generation technology used.

**Stability and Reactive Power Requirement**

Not required.

**Light Load Analysis – 2020**

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

**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.*

*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.

# Attachment 1 – Single Line Diagram