



2750 Monroe Blvd.
Audubon, PA 19403

Via E-mail

July 24, 2018

Belltown Power PA Projects, LLC
2401 Walnut Street
Philadelphia, PA 19103

Re: AD2-115, Lyons – Moselem 69 kV, Feasibility Study Report and System Impact Study Agreement

Dear Mr. Perrin:

Enclosed is a report documenting the results of the AD2-115 Feasibility Study. The results of this study are predicated on a 2021 transmission system based upon PJM's best assumptions at the present time for load growth and connection of proposed new generation additions.

Feasibility Studies are performed to provide an Interconnection Customer with preliminarily estimated reinforcement costs and information concerning attachment facilities and network upgrades. Since the analysis inherently has to include assumptions for future system conditions, the results should be used in this context. The costs and associated timing described in the enclosed report are based upon estimates given to PJM by the affected Transmission Owner(s). The costs are your responsibility as the project developer. More comprehensive estimates will be developed upon execution of a System Impact Study Agreement in accordance with Part VI of the PJM Tariff.

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. In some instances a project may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g., another interconnection project, 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 will be deferred until the System Impact Study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. In addition, the Feasibility Study estimates do not include any the costs associated with engineering and constructing the equipment and facilities on the developer's side of the point of interconnection. These costs are the responsibility of the project developer.

Pursuant to Section 204.3 of the PJM Tariff, enclosed is a copy of a System Impact Study Agreement for your consideration. The necessary deposit and executed agreement must be in the possession of PJM within thirty days (by close of business on **Thursday, August 23, 2018**) to maintain the project's position in the queue. In addition, your project's electrical data sheet must be completed and submitted electronically by the above date for the Impact Study Agreement to be considered complete.

- **Please use PJM's Queue Point system tool to submit Impact Study Data to PJM. Failure to submit this data by the due date will result in the withdrawal of your project.**
- **Please use the DocuSign system for executing this agreement; A link to the agreement is sent via email and each signatory recipient will have the ability to sign the agreement, or to re-assign it to someone else for signature. Upon PJM receiving the executed agreement, and the required system impact data being approved, PJM will send you a fully executed Impact Study Agreement and will conduct the study and provide you with a report of study results.**

Required with the signed agreement, per Section 3 of the enclosed System Impact Study Agreement is a deposit of **\$16,000** (\$1,000 of which is non-refundable).

The following information is provided for wire transfers:

Bank: PNC Bank, NA, New Jersey
ABA Number: 031-207-607
Account Number: 8013589826

Please e-mail PJM at SystemPlanning.Admin@pjm.com with the project name, queue number, date and amount of wire.

For check payments, please send the signed check to the following address:

Jeannette Mittan
PJM Interconnection, L.L.C.
2750 Monroe Blvd.
Audubon, PA 19403

In addition to the executed System Impact Study Agreement and deposit, you are responsible to ensure that all queue requests that you may have in the PJM queue are in good financial standing and that you meet the requirements of Tariff §204.3. Failure to meet the requirements of Tariff §204.3 or have your accounts in good standing will result in your project to be withdrawn from the queue. It is your responsibility to meet these requirements.

If you wish to discuss this agreement with me, please let me know. My office telephone number is 610-666-4322 and my email address is Bilal.Khashfe@pjm.com.

Sincerely,

A handwritten signature in cursive script that reads "B. Khashfe".

Bill Khashfe

Sr. Engineer

PJM Interconnection Projects

Attachments:

David Egan – PJM
DeJale Solomon – FirstEnergy
IP-Admin – PJM

***Generation Interconnection
Feasibility Study Report***

For

***PJM Generation Interconnection Request
Queue Position AD2-115***

Lyons – Moselem 69 kV

July 2018

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, 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 will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

General

Belltown Power PA, LLC (“Interconnection Customer”) has proposed a new solar generation facility of 20 MW net capability output. PJM recognizes 13 MW as Capacity Interconnection Rights for this project. The facility is located in Berks County, Pennsylvania. The proposed in-service date is October 31, 2020. **This study does not imply a Mid-Atlantic Interstate Transmission (MAIT or Met-Ed) commitment to this in-service date.**

Interconnection Customer obtained a qualifying facility (QF) status for the AD2-115 queue project. Please refer to the FERC’s “Guidelines for QF Status” which can be found at this link: <https://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp>. If this project studies move forward to a final study stage, PJM may tender an Interconnection Service Agreement (ISA) for this small generation project.

Point of Interconnection (“POI”)

The AD2-115 will interconnect with the Met-Ed subtransmission system through one of the following two options:

- Option 1 POI (or Primary POI) will be tapping the Lyons – Moselem 69 kV line at a point located about 1 miles from Lyons substation and 3 miles from Moselem substation. The tap will extend for 1-span towards Interconnection Customer’s generation site. The pole at the end of that span will be the location of the POI. The project will be modeled at bus #204605 (Lyons) and bus #204846 (Moselem).
- Option 2 POI (or Secondary POI) will be direct injection into the Lyons substation. Met-Ed will construct a new 69 kV line terminal at the substation. The dead-end structure will be the location of the POI. A full scope of work or estimated cost is not provided for the Secondary POI.

Please refer to Appendix 2 for interconnection one-line diagram.

Transmission Owner Scope of Work and Costs Summary

The Met-Ed facilities and network upgrades required to support the AD2-115 project are as follows:

- (a) Attachment Facilities: \$0
- (b) Direct Connection Network Upgrades
 - (b1) Tap the Allentown Cement-Lyons-South Hamburg 69kV line to the developer POI. @ Lyons-Moselem 69kV Line Tap to AD2-115 Substation**\$677,800**
- (c) Non-Direct Connection Network Upgrades: \$0
- (d) Direct Connection Local Upgrades: \$0
- (e) Non-Direct Connection Local Upgrades: \$0
- (f) Option to Build Upgrades: \$0

Estimated Total Costs (a) to (f):***\$677,800*

The above shown costs do not include Contribution in Aid of Construction (CIAC) Federal Income Tax Gross Up charge. The tax amount of \$138,100 may or may not be charged based on whether or not this project meets the eligibility requirements of IRS Notice 88-129.

Interconnection Customer Requirements

The proposed Customer Facilities must be designed in accordance with FirstEnergy's "Requirements for Transmission Connected Facilities" document located at: <http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx>. In particular, Interconnection Customer is responsible for the following:

1. The purchase and installation of a fully rated 69 kV circuit breaker to protect the AD2-115 generator lead line. A single circuit breaker must be used to protect this line; if the project has several GSU transformers, the individual GSU transformer breakers cannot be used to protect this line.
2. The purchase and installation of the minimum required FirstEnergy generation interconnection relaying and control facilities. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.
3. The purchase and installation of supervisory control and data acquisition ("SCADA") equipment to provide information in a compatible format to the FirstEnergy Transmission System Control Center.
4. Compliance with the FirstEnergy and PJM generator power factor and voltage control requirements.
5. The execution of a back-up service agreement to serve the customer load supplied from the AD2-115 generation project metering point when the units are out-of-service. This assumes the intent of the Interconnection Customer is to net the generation with the load.
6. Interconnection Customer will be required to meet all PJM, ReliabilityFirst, and NERC reliability criteria and operating procedures for standards compliance. For example, the IC will need to properly locate and report the over and under voltage and over and under frequency system protection elements for its units as well as the submission of the generator model and protection data required to satisfy the PJM and ReliabilityFirst audits. Failure to comply with these requirements may result in a disconnection of service if the violation is found to compromise the reliability of the FirstEnergy system.
7. Power Factor Requirements: Interconnection Customer shall design its solar-powered non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading (absorbing VARs) to 0.95 lagging (supplying VARs) measured at the high-side of the facility substation transformer(s) connected to the FirstEnergy transmission system.
8. System Protection Requirements: Interconnection Customer must design its Customer Facilities in accordance with all applicable standards, including the standards in FirstEnergy's "Requirements for Transmission Connected Facilities" document located at: <http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx>. Preliminary Protection requirements will be provided as part of the Facilities Study. Detailed Protection Requirements will be provided once the project enters the construction phase.
9. Interconnection Customer will be responsible for acquiring all easements, properties, and permits that may be required.

The above requirements are in addition to any metering or other requirements required by PJM.

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 Interconnection Customer's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

FirstEnergy Requirements

Interconnection Customer will be required comply with all FirstEnergy revenue metering requirements for generation interconnection customers which can be found in FirstEnergy's "Requirements for Transmission Connected Facilities" document located at:
<http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx>.

Schedule

Based on the scope of the attachment facilities, direct and non-direct system upgrades, it is expected to take eleven (11) months from the date of a fully executed Interconnection Construction Service Agreement and the occurrence a Construction Kick off Meeting to complete the installation. This includes a full payment for the work that is related to this interconnection project. It also assumes that the Interconnection Customer will provide the property for the Project direct connection facilities and all right-of-way, permits, easements, etc. that will be needed. A further assumption is that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined direct connection facilities and that transmission system outages will be possible when requested.

Network Impacts

OPTION 1 POI: Summer Peak Analysis – 2021

The Queue Project AD2-115 was evaluated as a 20.0 MW (Capacity 13.0 MW) injection tapping the Lyons to Moselem 69kV line in the METED area. Project AD2-115 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD2-115 was studied with a commercial probability of 53%. Potential network impacts were as follows:

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 the system impact study stage.

Short Circuit

None

Affected System Analysis & Mitigation

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 - 2021

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 at the system impact study stage.

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

OPTION 2 POI: Summer Peak Analysis - 2021

The Queue Project AD2-115 was evaluated as a 20.0 MW (Capacity 13.0 MW) injection at the Lyons 69kV substation in the METED area. Project AD2-115 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD2-115 was studied with a commercial probability of 53%. Potential network impacts were as follows:

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 the system impact study stage.

Short Circuit

None

Affected System Analysis & Mitigation

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 - 2021

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 at the system impact study stage.

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

Appendix 1

Facility Location

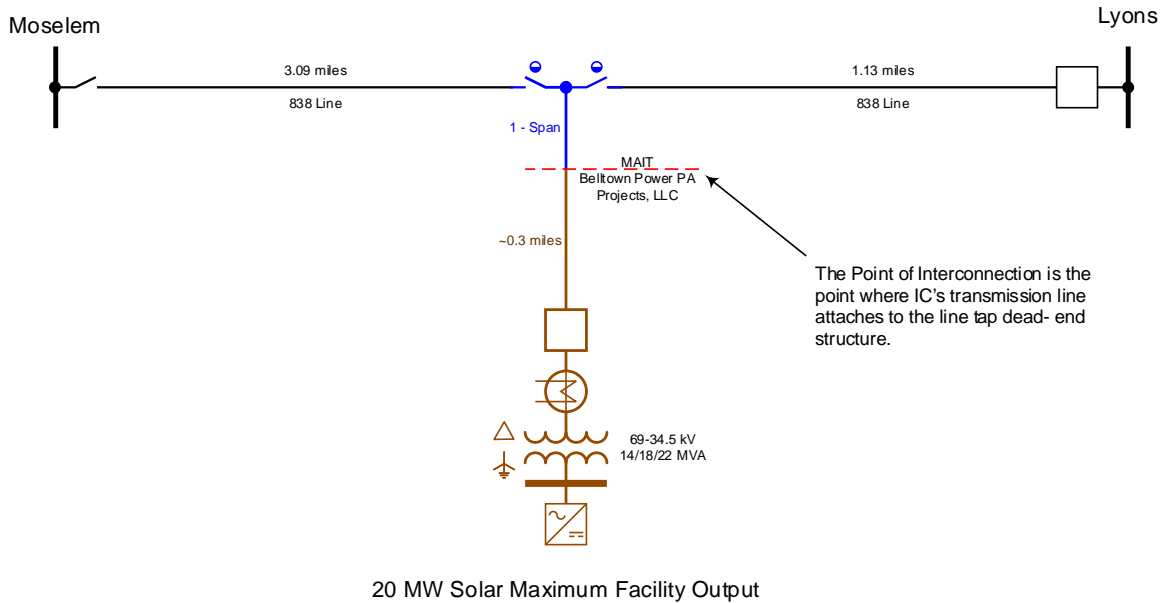
PJM Queue Position: AD2-115



Appendix 2

Interconnection One-Line Diagram

PJM Queue Position: AD1-115



Tap the 69 kV line at or near structure 838-175. Install disconnect switches with SCADA control and construct 1 span of 69 kV line towards the developer.

Customer facilities are shown for informational purposes only. The Customer is responsible for designing its facilities to comply with applicable FirstEnergy connection standards, including FE's "Requirements for Transmission Connected Facilities" document.

