



955 Jefferson Avenue
Valley Forge Corporate Center
Norristown, PA 19403-2497

VIA FedEx

January 27, 2012

Mr. Chris Andreola
Syncarpha Solar, LLC
645 Madison Avenue, 14th Floor
New York, NY 10022

Dear Mr. Andreola:

Re: PJM Queue Position X3-074, “Chestertown 69kV” Feasibility Study Report and System Impact Study Agreement

Enclosed is a report documenting the results of the PJM queue project X3-074, “Chestertown 69kV” Feasibility Study. The results of this study are predicated on a year 2015 transmission system and based on PJM’s best assumptions at the present time for load growth and for connection of proposed new generation additions. Feasibility Studies are performed to determine the facilities required for interconnection and to define the cost and timing for construction of direct connection facilities and transmission network upgrades required for the reliable interconnection of a generation project to the transmission system.

The direct connection facilities, network upgrades costs, and associated timing described in the enclosed report are based upon estimates given to PJM by Delmarva Power and Light Company. The costs are your responsibility as the project developer.

Pursuant to section 204.3 of the PJM Tariff, attached is a System Impact Study Agreement for your consideration. The Agreement must be executed and in PJM’s possession within thirty (30) days (**by close of business on February 29, 2012**) in order to maintain the project’s position in the queue. Please note that a non-refundable deposit of \$10,000 is required to accompany the signed Agreement.

Please ensure that all requirements of Section 204 of the PJM Tariff are completed when returning the System Impact Study Agreement including specifying the Point of Interconnection if more than one option was provided in the Feasibility Study Report.

In order to initiate the System Impact Study, please provide the information requested on this link: <http://www.pjm.com/planning/rtep-development/expansion-plan-process/form-impact-study-data.aspx> and submit it electronically. This information must be returned by **February 29, 2011** in order to maintain this project’s queue position.

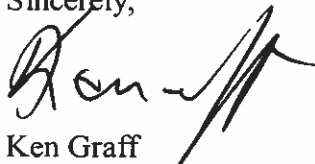
Two copies, with original signature on each, of the executed System Impact Study Agreement should be returned with the required study deposit to:

Jeannette Mittan
PJM Interconnection, L.L.C.
955 Jefferson Avenue, Business Center
Valley Forge Corporate Center
Norristown, PA 19403-2497
Phone: (610) 666-3158
FAX: (610) 666-4779

Costs for the Feasibility Study are being tabulated and you will receive an invoice in the near future. If you desire to discuss the Feasibility Study Report or the System Impact Study Agreement in more detail, please call me at (610) 666-4566 or email me at graaffk@pjm.com. A meeting or teleconference will be arranged at your convenience.

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 Jeannette Mittan at mittaj@pjm.com with the project's name, queue number, date and amount of wire.

Sincerely,



Ken Graff
Project Manager
Interconnection Projects

PJM DOCS #683926-v1
Enclosures

cc: Via e-mail (w/enclosures)
Jaelyn Cantler - PHI
Mike Mayer - PHI
Jeff Merryman - PHI

PJM Office of the Interconnection (w/enclosures)
Jay Liu - PJM
File

***Generation Interconnection
Feasibility Study Report***

For

***PJM Generation Interconnection Request
Queue Position X3-074***

Chestertown 69kV

January 2012

Preface

The intent of the Feasibility 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 will be deferred until the System Impact Study is performed.

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 may be 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

Syncarpha Solar, LLC, the Interconnection Customer (IC), has proposed an 11.9 MWE (4.5 MWC; 11.9 MW MFO) solar powered generating facility to be located in Chestertown, Kent County, Maryland. PJM studied X3-074 as an 11.9 MW injection into the Delmarva Power and Light (DPL) system and evaluated the project for compliance with reliability criteria for summer peak conditions in 2015. The planned in-service date, as stated in the Attachment N, is March 31, 2013.

Point(s) of Interconnection

The Interconnection Customer requested a Primary and Secondary Point of Interconnection (POI) be evaluated for the X3-074 project. The Primary POI selected was a 25kV distribution level interconnection at the Chestertown 25kV substation. The Secondary POI selected was a 69kV transmission level interconnection also at the Chestertown substation. The study results are provided in the Transmission Network Impacts section below.

Primary POI Option

X3-074 will interconnect with the Delmarva Power and Light system at the Chestertown 69/25kV substation as follows (see Attachment 1):

10 MWs will connect to the T1 transformer; 1.9 MWs will connect to the T2 transformer

Direct Connection Requirements

Transmission Owner Scope of Work

The scope of work and estimated costs for the direct connection facilities is as follows:

1. Establish two (2) new 25 kV feeders with 954 aluminum conductor from the Chestertown substation to the PV site – approximately .4 miles.
2. A utility operated recloser will be required on the customer tap that will have proper relaying and communication.
3. Utility grade primary metering will be required.
4. Generation telemetry and remote trip capabilities will be provided to the control center.
5. Perform a detailed time based study.
6. Protection, Planning, and other engineering departments will perform studies, design work, and prepare engineering estimates.
7. Transfer trip may be required.

The estimated cost to perform this work is as follows:

Estimated Costs			
Chestertown Substation T1			
New/Replacement Transformer			\$0
954 AAC Express Feeder	0.4	Miles	\$160,000
Fiber Installation		Miles	\$20,000
Fiber Termination			\$30,000
New Feeder Terminal			\$300,000
Recloser w/ Relaying and Communications			\$50,000
Utility Grade Metering			\$20,000
SCADA Integration into EMS			\$10,000
Detailed Time Based Study			\$30,000
Various Departments Work			\$20,000
Subtotal Cost			\$640,000
Subtotal Cost with 18% Overheads			\$755,200
Approximate Total Cost with 15% Contingency			\$868,480

Estimated Costs			
Chestertown Substation T2			
New/Replacement Transformer			\$0
954 AAC Express Feeder	0.4	Miles	\$160,000
Fiber Installation (N/A)		Miles	
New Feeder Terminal			\$300,000
Recloser w/ Relaying and Communications			\$50,000
Utility Grade Metering			\$20,000
SCADA Integration into EMS			\$10,000
Various Departments Work			\$20,000
Subtotal Cost			\$560,000
Subtotal Cost with 18% Overheads			\$660,800
Approximate Total Cost with 15% Contingency			\$759,920

The total approximate cost is **\$1,628,400**.

Use of existing feeders and terminals will be investigated in future studies which could potentially reduce overall total cost.

The estimated time to complete this work is **12 - 18 months** after receipt of a fully executed interconnection agreement.

Note: the above cost does not include the Contribution in Aid of Construction (CIAC) tax.

Special Operating Requirements

1. PHI will require the capability to remotely trip the generator from its System Operations facility. Such tripping may be facilitated by either a generator breaker, inverter (if so equipped), or a line recloser, depending upon the specific circumstances and the evaluation by PHI.
2. It is the Interconnection Customer's responsibility to send the data that PJM and the Company requires directly to PJM. The Interconnection Customer will grant permission for PJM to send the Company the following telemetry that the Interconnection Customer sends to PJM: real time MW, MVAR, volts, amperes, generator/status, and interval MWH and MVARH.
3. The Interconnection Customer will be required to make provisions for a voice quality phone line within approximately 3 feet of each Company metering position to facilitate remote interrogation and data collection.
4. A mutually acceptable means of interrupting and disconnecting the generator with a visible break, able to be tagged and locked out, shall be worked out with PHI Engineering.

Interconnection Customer Scope of Work

The Interconnection Customer (IC) is responsible for all design and construction related to activities on their side of the Point of Interconnection. Site preparation, including grading and an access road, as necessary, is assumed to be by the IC. Route selection, line design, and right-of-way acquisition of the direct connect facilities is not included in this report, and is the responsibility of the IC.

The IC will be required to install metering and telemetry equipment to provide revenue metering and real-time telemetry data to PJM. The requirements for this equipment are listed in Appendix 2, Section 8 of Attachment O to the PJM Tariff, as well as PJM Manuals 01 and 14D. Protective relaying and metering design and installation must comply with PHI's Applicable Standards.

The Interconnection Customer will purchase and install all metering instrument transformers as well as construct a metering structure per PHI's specifications. The secondary wiring connections at the instrument transformers will be completed by the Interconnection Customer's contractors and inspected by PHI, while the secondary wiring work at the metering enclosure will be completed by PHI's meter technicians. The metering control cable and meter cabinets will be supplied by PHI and installed by the Interconnection Customer's contractors. PHI's meter technicians will program and install two solid state multi function meters (Primary & Backup) for the new metering position.

Inverter Requirements and Capabilities

The inverter at the DG location shall have the following capabilities:

1. Voltage flicker reduction through dynamic VAR response
2. Ramp rate control
3. SCADA communications
4. Curtailment or other mitigation ability if high voltage were to occur
5. Low voltage and system disturbance ride through
6. Ability to receive and respond to a transfer trip or SCADA signal

The inverter shall operate in accordance with the IEEE 1547 series of standards that have been approved. While inverters should be capable of voltage stabilization thru dynamic VAR response and capable of low voltage and system disturbance ride through, neither of these capabilities shall be implemented until such time that the IEEE 1547 series of standards are revised and approved to include standards for these capabilities. At such time as these revised standards become available, the PV owner/operator shall cooperate with the Company (the 'Company' referring to ACE, DPL, or PEPCO) to implement these capabilities with settings acceptable to the Company. Until such time, the inverters shall operate with a fixed power factor schedule as supplied by the Company.

Transmission Network Impacts

Potential transmission network impacts are 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, Line with Failed 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

Short Circuit

No issues identified.

Stability Analysis

Not required due to project size.

Dynamic Analysis

DPL will commence a time-based dynamic study during the System Impact Study phase to evaluate the project’s impact on the DPL distribution system. Once complete, the results of the study will be reviewed and the proposed project will be evaluated for protection and coordination issues. Other required upgrades may be identified at that time.

System Protection

Protective relaying and metering design and installation must comply with PHI’s applicable standards. Any other costs determined by system protection as a result of the short circuit studies will be supplied in the near future.

Other Charges

PHI reserves the right to charge the Interconnection Customer Operation and Maintenance expenses to maintain the Interconnection Customer's Attachment Facilities, including metering and telecommunications facilities which are owned by PHI.

New System Reinforcements

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

None

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project.)

None

Potential Congestion due to Local Energy Deliverability

(PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection Request. Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full deliverability for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the identified overloaded element(s). As a result of the aggregate energy resources in the area, the following violations were identified:

These are **not** required reliability upgrades.

None

Secondary POI Option

PJM studied X3-074 as a 11.9 MW injection at the Chestertown 69kV substation.

Transmission Network Impacts

Potential transmission network impacts are 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, Line with Failed 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

Short Circuit

No issues identified.

Potential Congestion due to Local Energy Deliverability

(PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection Request. Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full deliverability for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the identified overloaded element(s). As a result of the aggregate energy resources in the area, the following violations were identified:

These are *not* required reliability upgrades.

None

Attachment 1

