



Community Solar Project Interconnection
Community Solar Project Tier 2 Review

Completed for

("Applicant")
OCS012

Proposed Interconnection
On PacifiCorp's
Circuit 5P15 out of Kennedy substation at approximately 45.589361,
-122.634028

May 13, 2020

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1.0 DESCRIPTION OF THE GENERATING FACILITY

(“Applicant”) proposed interconnecting 0.996 MW of new generation to PacifiCorp’s (“Public Utility”) circuit 5P15 out of Kennedy substation located in Multnomah County, Oregon. The project (“Project”) will consist of six (6) Solectria XGI 1500 – 166 kW inverters for a total requested output of 0.996 MW. The requested commercial operation date is 9/30/2021.

The Public Utility has assigned the Project “OCS012.”

2.0 APPROVAL CRITERIA FOR TIER 2 INTERCONNECTION REVIEW

Pursuant to Section H of the Public Utility’s CSP Interconnection Procedures, a Public Utility must use the Tier 2 interconnection review procedures for an application to interconnect a small generator facility that meets the following requirements:

- (a) The Community Solar Project must have a nameplate capacity of two (2) megawatts or less;
- (b) The Community Solar Project must be interconnected to either a radial distribution circuit or a spot network distribution circuit limited to serving one customer; and
- (c) The Community Solar Project must use interconnection equipment that is either lab-tested equipment or field tested equipment. For equipment to gain status as field-tested equipment, the applicant must provide all the documentation from the prior Tier 4 study, review, and approval, including any interconnection studies and the certificate of completion.

3.0 PROPOSED POINT OF INTERCONNECTION

The Applicant’s application for Interconnection of Community Solar Project specified a requested Point of Interconnection (“POI”) on the Public Utility’s distribution circuit 5P391 out of Vernon substation. However, the Public Utility is currently constructing upgrades to its distribution system in this area that will reconfigure several distribution circuits including the circuit at the Applicant’s proposed POI. The Public Utility has analyzed the anticipated load on the new circuit at this location and determined that the Applicant’s proposed size of 0.996 MW will meet the eligibility requirements for the Community Solar Program.

The Applicant’s proposed Community Solar Project will be interconnected to the Public Utility’s distribution circuit 5P15 out of Kennedy substation via a new 12.5 kV overhead primary meter. The POI will be located near 9110 NE Sunderland Ave in Multnomah County, Oregon. Figures 1 and 2 below are a map and one-line diagram that specifies the location and illustrates the interconnection of the proposed generating facility to the Public Utility’s system.

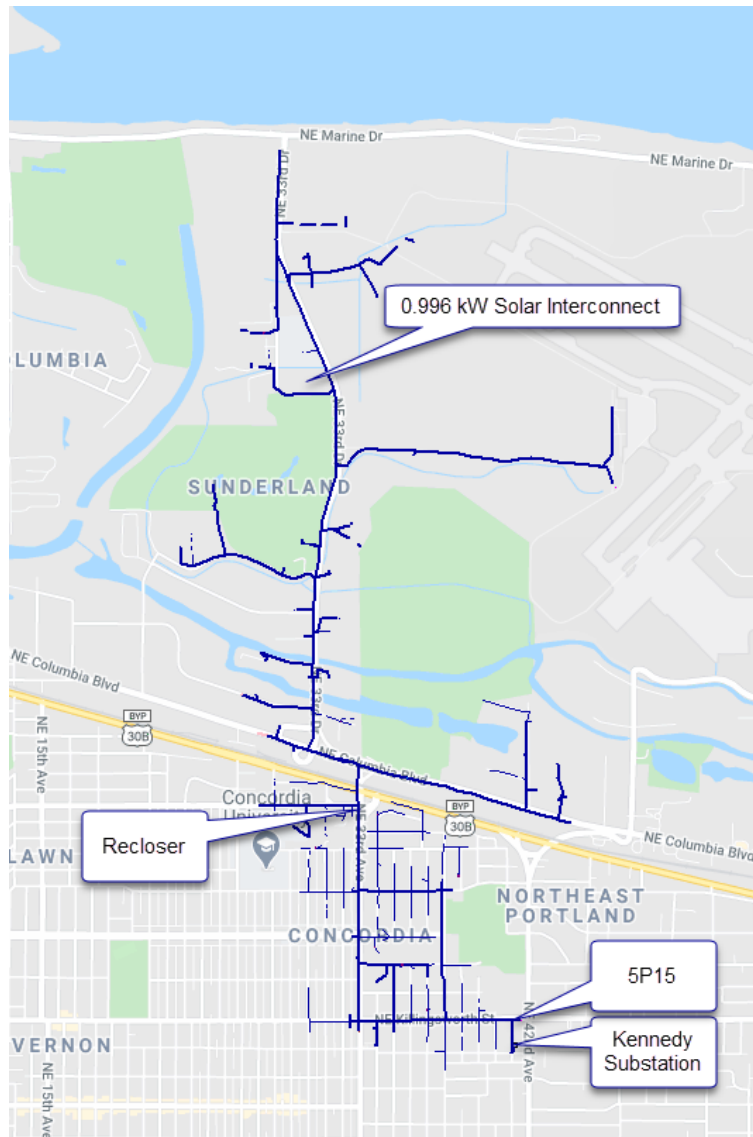


Figure 1: Map

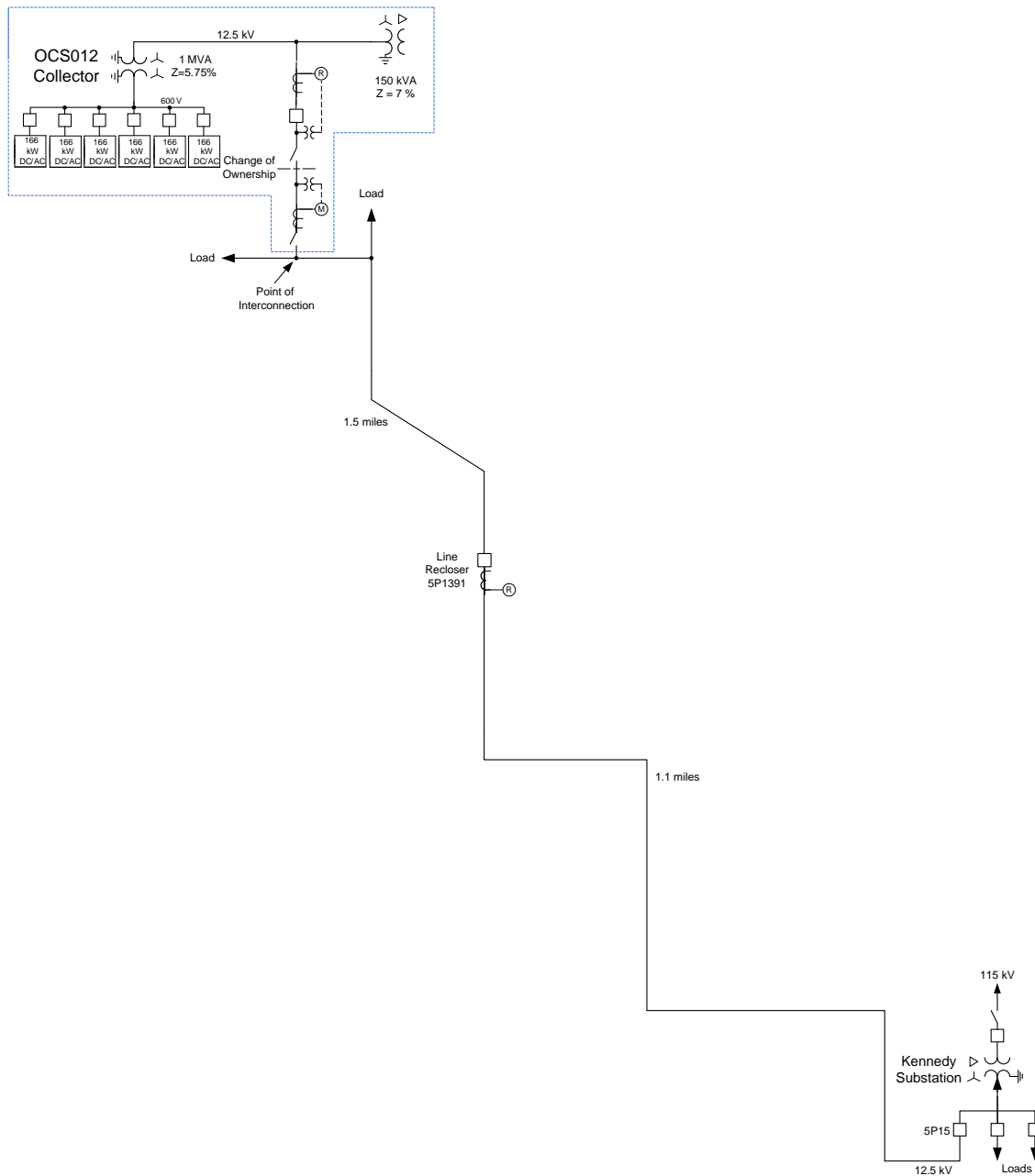


Figure 2: One Line Diagram

3.1 Review Assumptions

- All active higher-priority requests for transmission service and/or generator interconnection service (including requests in the traditional interconnection queue and other requests in the Community Solar queue) in the local area of the requested POI will be considered in this study and are listed in Appendix 1. If any of these requests

- are withdrawn, the Public Utility reserves the right to restudy this request, as the results and conclusions contained within this study could significantly change.
- The Applicant's request for interconnection service in and of itself does not convey transmission service.
 - This study assumes the Project will be integrated into Public Utility's system at the agreed upon and/or proposed Point of Interconnection.
 - The Applicant will construct and own any facilities required between the point of interconnection and the Project.
 - Generator tripping may be required for certain outages.
 - All facilities will meet or exceed the minimum WECC, NERC, and Public Utility performance and design standards.
 - The generator is expected to operate during daylight hours, 7 days a week, 365 days a year. The primary meter (POI) generation facility being installed.
 - This report is based on information available at the time of the study. It is the Applicant's responsibility to check the Public Utility's web site regularly for transmission system updates (<https://www.oasis.oati.com/ppw>)

4.0 TIER 2 COMMUNITY SOLAR PROJECT RESULTS

4.1 Screen 1

For interconnection of a Community Solar Project to a radial distribution circuit, the aggregated nameplate capacity on the circuit must not exceed 15 percent of the line section annual peak load as most recently measured at the substation or calculated for the line section.

Result: Pass

Pass – peak load is expected to be near 8.1 MW on this circuit.

4.2 Screen 2

For interconnection of a Community Solar Project to the load side of spot network protectors, the aggregated nameplate capacity on the load side of the spot network protectors must not exceed the lesser of five percent of a spot network's maximum load or 50 kilowatts.

Result: N/A

Proposed Community Solar Project is on a radial distribution circuit.

4.3 Screen 3

The aggregated nameplate capacity must not contribute more than 10 percent to the distribution circuit's maximum fault current at the point on the primary voltage distribution line nearest the point of interconnection.

Result: Pass

The OCS012 solar project will only contribute 9 % of the maximum fault current.

4.4 Screen 4

The aggregated nameplate capacity on the distribution circuit must not cause any distribution protective devices and equipment (including substation breakers, fuse cutouts, and line reclosers) or other public utility equipment on the transmission or distribution system to be exposed to fault currents exceeding 90 percent of the short circuit interrupting capability. The Community Solar Project's Point of Interconnection must not be located on a circuit that already exceeds 90 percent of the short circuit interrupting capability.

Result: Pass

The short circuit interrupting rating of the existing equipment is well above the available fault current.

4.5 Screen 5

The aggregated nameplate capacity on the distribution side of a substation transformer feeding the circuit where the small generator facility proposes to interconnect must not exceed 10 megawatts in an area where there are known or posted transient stability limitations to generating units located in the general electrical vicinity (for example, three or four distribution busses from the point of interconnection).

Result: Pass

4.6 Screen 6

If the Community Solar Project interconnection is to a primary line on the distribution system, then the interconnection must meet the following criteria:

- (A) If the Community Solar Project is three-phase or single-phase and will be connected to a three-phase, three-wire primary line, then the Community Solar Project must be connected phase-to-phase.
- (B) If the Community Solar Project is three-phase or single-phase and will be connected to a three-phase, four-wire primary line, then the Community Solar Project must be connected line-to-neutral and effectively grounded.

Result: Fail

As discussed in the initial scoping meeting for the OCS012 project, the project will be connected to a four-wire multi-grounded circuit. The equipment proposed by the Applicant in their project one line diagram does not make the project an effectively grounded source to the 12.5 kV circuit. A grounding transformer as shown in Figure 2 can be added to satisfy this requirement.

4.7 Screen 7

For interconnection of a Community Solar Project to a single-phase shared service line on the distribution system, the aggregated nameplate capacity on the shared secondary line must not exceed 20 kilowatts.

Result: N/A

The proposed Community Solar Project does not have a single-phase shared service line

on the distribution system.

4.8 Screen 8

For interconnection of a single-phase Community Solar Project to the center tap neutral of a 240-volt service line, the addition of the Community Solar Project must not create a current imbalance between the two sides of the 240-volt service line of more than 20 percent of the nameplate rating of the service transformer.

Result: N/A

4.9 Screen 9

Except as provided in Screen 12, the interconnection of the Community Solar Project must not require system upgrades or interconnection facilities different from or in addition to the applicant's proposed interconnection equipment.

Result: Fail

A 12.5 kV grounding transformer will need to be installed as part of the Applicant's generating facility.

4.10 Screen 10

The aggregated nameplate capacity, in combination with exiting transmission loads, must not cause the transmission system circuit directly connected to the distribution circuit where the Community Solar Project interconnection is proposed to exceed its design capacity.

Result: Pass

Pass – this project is not expected to backfeed transmission system.

4.11 Screen 11

If the public utility's distribution circuit uses high speed reclosing with less than two seconds of interruption, then the Community Solar Project must not be a synchronous machine. If the small generator facility is a synchronous machine, then the applicant must submit a Tier 4 application.

Result: Pass

Invertor source.

4.12 Screen 12

If the Community Solar Project fails to meet one or more of the criteria in Screens 1 - 11, but the Public Utility determines that the Community Solar Project could be interconnected safely if minor modifications to the transmission or distribution system were made (for example, changing meters, fuses, or relay settings), then the Public Utility must offer the applicant a good-faith, non-binding estimate of the costs of such proposed

minor modifications. Modifications are not considered minor under this subsection if the total cost of the modifications exceeds \$10,000. If the Applicant authorizes the Public Utility to proceed with the minor modifications and agrees to pay the entire cost of the modifications, then the Public Utility must approve the application under Tier 2.

Result: Fail

Required system upgrades and interconnection facilities are estimated to exceed \$10,000.

A three phase line extension from the Point of Interconnection to the point of change of ownership will be required including at least two poles, a gang operated switch, cutouts, fuses, jumpers, conductor, instrument transformers and metering equipment will need to be installed.

5.0 TIER 2 – NEXT STEPS

Although the Applicant's interconnection request fails Screens 6, 9 and 12 the Public Utility has determined that it will not require additional studies in order to approve the interconnection request.

6.0 PARTICIPATION BY AFFECTED SYSTEMS

No Affected Systems were identified in relation to this Interconnection Request.

7.0 APPENDICES

Appendix 1: Higher Priority Requests in the Local Area of the Requested POI

Appendix 2: Informational Network Resource Interconnection Service Assessment

APPENDIX 1:
HIGHER PRIORITY REQUESTS IN THE LOCAL AREA OF THE
REQUESTED POI

All active higher-priority requests for transmission service and/or generator interconnection service (including requests in the traditional interconnection queue and other requests in the Community Solar queue) in the local area of the requested POI will be considered in this study and are identified below. If any of these requests are withdrawn, the Public Utility reserves the right to restudy this request, as the results and conclusions contained within this study could significantly change.

Transmission/Generation Interconnection/Community Solar Queue Requests considered:

No active requests in this area.

**APPENDIX 2:
INFORMATIONAL NETWORK RESOURCE INTERCONNECTION SERVICE
ASSESSMENT**

The study results described above reflect an energy resource interconnection service (“ERIS”) evaluation, modified in the CSP program rules to examine only generation and load conditions local to the requested CSP project’s interconnection point (sometimes referred to as the “zoomed in view”). The “zoomed in view” functions to: (1) study the project’s proposed interconnection without considering certain existing or higher-queued requests outside of the local area; and (2) to inform whether the CSP facility must cap its project to mitigate, although not eliminate, the risk of potential deliverability-related network upgrades to accommodate the proposed CSP generator.

By contrast, the following informational section provides a network resource interconnection service (“NRIS”) evaluation performed with traditional assumptions, i.e., not modified to examine only local generation and load conditions, but rather one that assumes that all existing interconnections, higher-queued requests for interconnection service (in both the traditional and CSP queue), and generators with executed contracts beyond the local area are in-service. Depending on the severity of the conditions created when absorbing additional generation (capped or not capped) in that broader, “zoomed out” area, the local area-focused generator size cap developed in the “zoomed in” examination may not be sufficient to mitigate the need for deliverability-related network upgrades. Regardless of this report’s informational NRIS results, the deliverability-related network upgrades ultimately necessary to accommodate the proposed CSP generator will depend on conditions present when the future transmission service study is performed, as well as whether network upgrade alternatives are available at that time.

Considering existing generation and higher-queued requests to interconnect in the Portland area where the CSP generator proposes to interconnect, 0.996 MW of additional generation can be absorbed. As a result, the transmission provider determines that no additional network upgrades would be required for the aggregate of generation in the local area to be delivered to the aggregate of load on the transmission provider’s transmission system (the NRIS study scope).