Appendix A – Q829

Solargen Energy, Inc.

PV2 Panoche Valley Solar

Interconnection Reassessment Study Report

September 18, 2013

This study has been completed in coordination with Pacific Gas and Electric per CAISO Tariff Appendix DD Generator Interconnection and Deliverability Allocation Procedures (GIDAP)

1. Executive Summary

Solargen Energy, Inc., an Interconnection Customer (IC), has submitted a completed request to the California Independent System Operator Corporation (CAISO) for PV2 Panoche Valley Solar (Project).

The Project is a solar photovoltaic plant with a proposed Point of Interconnection (POI) at Pacific Gas and Electric's (PG&E) Moss Landing – Panoche and Coburn – Panoche 230 kV Lines in San Benito County, California. The customer has solicited Full Capacity Deliverability Status for the Project, as well as a proposed Commercial Operation Date of December 15, 2015 for the Project.

CAISO and PG&E had completed the Cluster 3-4 Phase II interconnection studies in accordance with the CAISO Tariff Appendix Y Generator Interconnection Procedures (GIP). The Cluster 3-4 Phase II report was sent out on 5th November 2012. This was followed up with addendums the latest one being issued on 29th May 2013.

In accordance with the latest California Independent System Operator (CAISO) Generator Interconnection and Deliverability Allocation Procedures (GIDAP) Tariff Appendix DD, CAISO and PG&E performed a reassessment prior to the beginning of the Queue Cluster 5 (QC5) Phase II Interconnection Study. The reassessment evaluates the impacts on the Network Upgrades identified in previous interconnection studies due to Interconnection Request withdrawals, transmission additions and upgrades approved in the most recent Transmission Planning Process cycle.

The studies that were conducted relevant to the Project are outlined below:

- Steady State Power Flow Analyses
- Short Circuit Duty Analyses
- Deliverability Assessment

The details of the reassessment study are provided in the main body of the Fresno Reassessment group report. The reassessment has concluded that many of the network upgrades identified in the pre-Cluster 5 Studies can be removed. Please refer to Table-B5 of Appendix B of the Fresno Group report for the details on the Pre Cluster 5 transmission upgrades.

2. Upgrades, Costs and Time to Construct Estimates

There are no changes to the Plan of Service of the Participating Transmission Owner (PTO)'s Interconnection Facilities. The PTO's Interconnection Facilities and Network Upgrades which the Project was allocated have been updated to reflect the results of the Reassessment Study and are described in Table 2-1.

Table 2-1: Escalated Cost and Time to Construct for Interconnection Facilities, Reliability Network Upgrades, and Delivery Network Upgrades

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Cost x 1,000	Estimated Time (Months) to Construct (Note 1)
PTO's Interconnection Facilities (Note 2)	Work at the IC's site	Engineering Reviews, Pre-parallel inspection, testing, SCADA, RTU, setup, meters, etc.	100%	$410	$452	24
	Q829 Substation	Installation of generation tie line, deadend, switch, CCVT's and IPAC protection	100%	$1,118	$1,233	22
	Transmission Line	Install one (1) span T-Line conductor Install one (1) single-circuit dead end TSP Review and interface of IC owned TSP	100%	$225	$248	12
Reliability Network Upgrades	Q829 Substation **(Note 3)**	Installation of three-bay Breaker-and-a-Half 230kV switching station with eight CB's	100%	$21,422*	$23,611*	46
		PG&E Engineering, and Oversight with Inspection	100%	N/A	$900	4
	Panoche Substation	Installation of two line current differentials	100%	$490	$540	22
	Moss Landing Substation	Installation of Pilot relay scheme	100%	$209	$230	18
	Coburn Substation	Installation of Pilot relay scheme	100%	$209	$230	18
	Panoche Fiber	Installation of 17 miles of new fiber to Q829	100%	$5,950	$6,558	22
	Transmission Line Work	Installation of one span transmission line Installation of one TSP Review of customer's TSP	100%	$1,480	$1,631	12
Delivery Network Upgrades	Re-conductor Los Banos-4C779 #1 230 kV Line (Los Banos to Pole #90/406)	Re-conductor 4.5 miles section of 230 kV transmission line.	6.28%	$1,785	$1,917	30

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Cost x 1,000	Estimated Time (Months) to Construct (Note 1)
	Re-conductor S647SS-Oro Loma 115 kV Line (Oro Loma to Pole #15/1)	Re-conductor 3.35 miles of 115 kV transmission line. Replace all wood poles.	5.35%	$162	$175	30
			Total	**$12,039**	**$14,114**	

Note 1: The Estimated Time to construct is the schedule for the PTO to complete only the construction activities for the specified facility. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals; construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.

The estimated time to construct forms the basis for escalated costs. The escalation factors to convert the Estimated cost (in 2012 dollars) to the operating year is found in the published per unit table in CAISO website http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx.

Note 2: The Interconnection Customer is obligated to fund these upgrades and will not be reimbursed.

Note 3: The cost to build the new 230kV Switching Station network upgrade is for informational purposes only. It is not included in total cost due since the IC will engineer, procure, and construct this facility. The estimated time to construct these facilities is based on the IC's request to build these facilities.

Appendix A – Q829

Solargen Energy, Inc.

PV2 Panoche Valley Solar

Interconnection Reassessment Study

Revision # 1

(Cost Reallocation)

November 27, 2013

This study has been completed in coordination with Pacific Gas and Electric per CAISO Tariff Appendix DD Generator Interconnection and Deliverability Allocation Procedures (GIDAP)

1. Executive Summary

In September 2013 the ISO issued the results of its first annual Generation Interconnection and Deliverability Allocation Procedures reassessment study. Projects affected by the reassessment in PGE were issued an individual reassessment study report documenting the elimination of network upgrades resulting from project withdrawals. The ISO later determined that the reports were incomplete because they did not take the next step and reallocate the remaining network upgrades costs, originally allocated to withdrawn projects, among the remaining projects within a study group.

Subsequently, ISO issued a technical bulletin titled "*Reassessment Process Reallocation of Cost Shares for Network Upgrades"* on October 29, 2013 describing the process for the reallocation of cost shares for network upgrades impacted by the reassessment process. Based on the inputs from the stakeholders ISO decided to update the cost allocation percentages for the projects.

This report revises the cost allocation percentage and the costs for the project

2. Upgrades, Costs and Time to Construct Estimates

In accordance with the Generation interconnection and deliverability technical bulletin, Table 2-1 has been updated to capture the cost reallocation for the project.

Table 2-1: Escalated Cost and Time to Construct for Interconnection Facilities, Reliability Network Upgrades, and Delivery Network Upgrades

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Cost x 1,000	Estimated Time (Months) to Construct (Note 1)
PTO's Interconnection Facilities (Note 2)	Work at the IC's site	Engineering Reviews, Pre-parallel inspection, testing, SCADA, RTU, setup, meters, etc.	100%	$410	$452	24
	Q829 Substation	Installation of generation tie line, deadend, switch, CCVT's and IPAC protection	100%	$1,118	$1,233	22
	Transmission Line	Install one (1) span T-Line conductor Install one (1) single-circuit dead end TSP Review and interface of IC owned TSP	100%	$225	$248	12
Reliability Network Upgrades	Q829 Substation **(Note 3)**	Installation of three-bay Breaker-and-a-Half 230kV switching station with eight CB's	100%	$21,422*	$23,611*	46
		PG&E Engineering, and Oversight with Inspection	100%	N/A	$900	4
	Panoche Substation	Installation of two line current differentials	100%	$490	$540	22
	Moss Landing Substation	Installation of Pilot relay scheme	100%	$209	$230	18
	Coburn Substation	Installation of Pilot relay scheme	100%	$209	$230	18
	Panoche Fiber	Installation of 17 miles of new fiber to Q829	100%	$5,950	$6,558	22
	Transmission Line Work	Installation of one span transmission line Installation of one TSP Review of customer's TSP	100%	$1,480	$1,631	12
Delivery Network Upgrades	Re-conductor Los Banos-4C779 #1 230 kV Line (Los Banos to Pole #90/406)	Re-conductor 4.5 miles section of 230 kV transmission line.	**7.77%**	2209	2373	30

Type of Upgrade	Upgrade	Description	Cost Allocation Factor	Estimated Cost x 1,000	Escalated Cost x 1,000	Estimated Time (Months) to Construct (Note 1)
	Re-conductor S647SS-Oro Loma 115 kV Line (Oro Loma to Pole #15/1)	Re-conductor 3.35 miles of 115 kV transmission line. Replace all wood poles.	**8.46%**	257	276	30
			Total	**$12,558**	**$14,671**	

Note 1: The Estimated Time to construct is the schedule for the PTO to complete only the construction activities for the specified facility. The estimated schedule does not take into account unanticipated delays or difficulties securing necessary permits, licenses or other approvals; construction difficulties or potential delays in the project implementation process; or unanticipated delays or difficulties in obtaining and receiving necessary clearances for interconnection of the project to the transmission system.

The estimated time to construct forms the basis for escalated costs. The escalation factors to convert the Estimated cost (in 2012 dollars) to the operating year is found in the published per unit table in CAISO website http://www.caiso.com/informed/Pages/StakeholderProcesses/ParticipatingTransmissionOwnerPerUnitCosts.aspx.

Note 2: The Interconnection Customer is obligated to fund these upgrades and will not be reimbursed.

Note 3: The cost to build the new 230kV Switching Station network upgrade is for informational purposes only. It is not included in total cost due since the IC will engineer, procure, and construct this facility. The estimated time to construct these facilities is based on the IC's request to build these facilities.

The following table provides the total network upgrade cost and the cost caps for the project.

Total Network Upgrade (Excluding IFC)	**$12,738,838**
Cost Cap	**$79,304,861**

The remainder of the reassessment report does not get impacted due to this revision.