

[REDACTED]
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[REDACTED]

Facility Study Report

April 9, 2014



Prepared by:

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Approved by:

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SOUTHERN CALIFORNIA EDISON COMPANY

EXECUTIVE SUMMARY

██████████ applied to Southern California Edison (“SCE”) for interconnection and wholesale distribution service for its proposed Solar Project pursuant to SCE’s Wholesale Distribution Access Tariff (“WDAT”) Small Generator Interconnection Procedures. SCE performed a Facility Study as requested by ██████████ interconnection and distribution service from an existing ██████████ (“Gobar ██████████”). The interconnection is to be located approximately 2.89 miles from the Cottonwood Substation on the Gobar ██████████ circuit out of SCE’s Cottonwood ██████████ Substation. The request is for a WDAT photovoltaic (“PV”) generation facility with a total capacity of ██████████. The initial request is for service to commence by October 2015¹.

The new generation, consisting of ██████████ will receive interconnection service from SCE’s existing ██████████ on the Gobar ██████████ out of Cottonwood Substation via an ██████████ to the applicant-owned ██████████. The generated power would be delivered to the California Independent System Operator (“CAISO”) grid at the ██████████ of SCE’s Cottonwood Substation.

The purpose of this Facility Study is to determine:

- The estimated cost for the Distribution Upgrades and Interconnection Facilities which were identified in the System Impact Study².
- The estimated time required to complete the design and construction of the Distribution Upgrades and Interconnection Facilities which were identified in the System Impact Study.
- Voltage Variation at Cottonwood Substation caused by the generating facility.

Non-binding order of magnitude cost estimates for the required interconnection facilities and ██████████ upgrades are as follows:

<u>Interconnection Facilities</u>	\$ 195.0 K
○ ██████████	
○ ██████████	
○ ██████████	
○ ██████████	

¹ Date as requested in the application. The actual operating date depends on design and construction requirements.

² A copy of the System Impact Study is provided as Attachment A.

Telemetry Requirements	\$ 157.0 K
○ Telecommunication	
○ Power System Control	

Corporate Environment, Health, Safety:	\$ 101.0 K
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Real Properties	\$ 10.8 K
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Distribution Upgrades

○ [REDACTED]	\$ 34.1 K
○ Load Tap Changing settings	\$ 10.0 K

Subtotal	\$ 507.9 K
ITCC (35%)	\$ 174.3 K
Total non-binding order of magnitude cost estimate	\$ 682.2 K

³ This requirement will not prevent the project from being interconnected to the distribution system if adequate arrangements are made in the interconnection agreement to fund this scope of work

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Attachment A: System Impact Study

I. INTRODUCTION

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the California Independent System Operator ("CAISO") grid at the [REDACTED] of SCE's Cottonwood Substation.

The purpose of this Facility Study is to determine:

- The estimated cost for the Distribution Upgrades and Interconnection Facilities which were identified in the System Impact Study.
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II. Results

[REDACTED] causes reverse power flow at Cottonwood Substation during daytime minimum load, as well as peak load conditions. This reverse power flow has the potential to affect the existing [REDACTED] settings at the substation through the [REDACTED]. In order to mitigate this condition, the [REDACTED] settings will have to be adjusted to detect reverse power flow, and allow the [REDACTED] to perform its normal operation.

III. SUMMARY

1. Distribution Upgrades will be required to interconnect this project. Distribution upgrades include the reprogramming of an existing [REDACTED] to monitor any reverse power flow going back to the [REDACTED] bus at Cottonwood Substation.
2. Interconnection facilities include the installation of a new [REDACTED] [REDACTED] between existing [REDACTED] line and the applicant's [REDACTED].
3. Corporate Environment, Health, and Safety:

Obtain licensing and permits and perform all required environmental activities for the construction of the following project elements if applicable:

Install a new [REDACTED] [REDACTED] [REDACTED] between the [REDACTED] line and the applicant's [REDACTED] [REDACTED].

For SCE facilities and scope of work not subject to CPUC's GO 131-D, SCE will follow the requirements of all applicable environmental laws and regulations and issue an in-house Environmental Clearance before commencement of construction activities. The cost estimates provided assume that SCE will perform all required environmental activities for SCE facilities and scope of work from the siting through the post-construction phases. However, it is recommended for SCE facilities and scope of work

to be included in the Generator's Environmental Licensing and Permitting documents to streamline the environmental process and avoid unnecessary delays in construction. The responsibilities for performing certain environmental activities may be negotiated during or after the Interconnection Agreement process.

4. Real time telemetry will be required.
5. Non-binding order of magnitude cost estimates for the required interconnection facilities and system upgrades are as follows and do not include the cost of any civil construction required by the interconnection.

The non-binding order of magnitude cost estimates for the required interconnection facilities and [REDACTED] upgrades are as follows:

<u>Interconnection Facilities</u>	\$ 195.0 K
o [REDACTED]	
o [REDACTED]	
o [REDACTED]	
o [REDACTED]	
Telemetry Requirements	\$ 157.0 K
o Telecommunication	
o Power System Control	
Corporate Environment, Health, Safety:	\$ 101.0 K
Real Properties	\$ 10.8 K
<u>Distribution Upgrades</u>	
o [REDACTED]	\$ 34.1 K
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Subtotal	\$ 507.9 K
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⁵ This requirement will not prevent the project from being interconnected to the distribution system if adequate arrangements are made in the interconnection agreement to fund this scope of work

The design of the Interconnection Facilities will take be approximately 60 business days from the execution of the Small Generator Interconnection Agreement (SGIA) and from the time the applicant has provided the following to SCE:

- *Approved panel drawings which shall comply with the SCE ESR. These requirements can be downloaded at :
<http://www.sce.com/AboutSCE/Regulatory/distributionmanuals/esr.htm>*
 - *Customer information sheet.*
 - *Street improvement plans (if available)*
 - *Unique address for point of change of ownership*
 - *Public Right away (Street) base maps as required by the interconnection.*
 - *Site plot plan on a 30:1 scale or digital file*
 - *Easements/lease agreement*
 - *Grading plans*
 - *Sewer and storm plot plans*
 - *Landscape, Sprinkler, Pedestal Locations*
 - *Underground civil construction is released by SCE inspectors.*
6. The construction of the electrical facilities will take approximately 18 months⁶. The Interconnection Customer is responsible to perform the underground civil work per SCE's design. SCE will then approve and release the applicant-installed underground infrastructure prior to SCE initiating the construction of the electrical facilities. The underground civil work includes, but is not limited to, excavation (all necessary trenching, backfilling, and other digging as required) and installation of conduits and vaults for the required interconnection facilities.
7. Due to distribution upgrades or interconnection facilities triggered by earlier queue projects and for which this project is depending on, the construction of the interconnection facilities for this project may not commence until approximately 18-24 months from the release of this report. The actual timing will be a function of the completion date of the distribution upgrades triggered by earlier queued projects.
8. Where formal rights-of-way, easements, land leases, or permits are required by SCE for installation of facilities, on or over Applicant's property, or the property of others, the Applicant shall grant SCE the rights-of-way and easements for the proposed scope of work.
9. Current distribution standards are being updated to address generation interconnection systems. The proposed method of service on this report may change according on final design to comply with the updated distribution design standards.
10. A coordination study may be required during final engineering. The coordination study may identify additional interconnection requirements such as reprogramming and/or relocating existing protection devices, installing new protective devices, etc. The additional scope of work may have an effect on the applicant's requested operating date.

⁶ The installation and/or reprogramming of the [REDACTED] will not prevent the interconnection customer from achieving the commercial operation date for the project.

11. Applicant is responsible for the construction of underground facilities needed for the interconnection facilities. The construction of the underground facilities must be based on SCE design drawings.
12. This study does not include analysis related to the power output rate of change that may occur due to the following or other conditions;
 1. System morning start up for solar systems. That is when each morning the generating facility commences to generate and export electrical energy to the distribution system.
 2. ██████████ generating facilities have significant generation output variation (*Variability*) which can have an impact on distribution system voltage profiles.

The study assumes the customer's generating facility will have equipment, software and the appropriate controls in place to be able to control the generation output rates of change as specified by SCE in order to maintain appropriate voltage levels under all conditions including, but not limited to, the conditions identified above. Upon execution of the appropriate Interconnection Agreement, SCE will provide the Interconnection Customer the required ramp rate control parameters. The ramp rate controls will be a function of the generation penetration on the distribution system as well as SCE's distribution system configuration but other parameters may be considered. Therefore, changes to the ramp rate control scheme may be required from time to time as required by increases in generation, changes in the distribution system topology, or other changes in the distribution system.

Attachment A – System Impact Study