

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding
Policies, Procedures and Rules for the
California Solar Initiative, the
Self-Generation Incentive Program and
Other Distributed Generation Issues.

Rulemaking 12-11-005
(Filed November 8, 2012)

**OPENING COMMENTS OF SOLARCITY CORPORATION ON THE
PROPOSED DECISION REGARDING NET ENERGY METERING
INTERCONNECTION ELIGIBILITY FOR STORAGE DEVICES
PAIRED WITH NET ENERGY METERING GENERATION FACILITIES**

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Finding of Fact X (new)

Comment: To address reimbursement of fees collected prior to issuance of a final order in this docket.

Proposed New Finding of Fact:

X. Application fees and charges have been collected by the utilities that are not aligned with the limitations on fees described in this order, and those fees and charges should be refunded to applicants to align with this order.

Finding of Fact 9:

Comment: To maintain the current methodology under the NEM-MT, the following change would allow interval data comparison of exports to the grid with generation by the renewable energy system, excluding storage, to determine NEM credits..

Current Language:

9. The point of measurement for the de-rate factor is at or near the point where the GF interconnects with the grid or internal power line, such that all AC energy into and out of the GF can be directly measured.

Proposed Change:

9. To determine NEM credits, the energy output from the GF excluding storage shall be measured and compared with exports to the grid. Energy output from the GF excluding storage shall be measured either on the AC-side of an inverter without storage behind the meter, or on the DC-side of the inverter on the GF excluding storage, then adjusted to AC to reflect inverter losses. The point of measurement for the de-rate factor is at or near the point where the GF interconnects with the grid or internal power line, such that all AC energy into and out of the GF can be directly measured.

Conclusion of Law X (new)

Comment: To address reimbursement of fees collected prior to issuance of a final order in this docket.

Proposed New Conclusion of Law:

X. The utilities should refund application fees and charges have been collected prior to issuance of this order that would not have been permitted had this order been in place when those fees and charges were assessed.

Conclusion of Law 6

Comment: It has been an industry understanding that Rule 21 allows for interconnection of stand-alone storage facilities, because storage is explicitly included in the definition of a “Generating Facility.” The interpretation in the PD implies that the only circumstances where storage is a “Generating Facility,” for purposes of interconnection, is where storage is paired with renewable generation as an addition or enhancement.

Current Language:

6. The definition of GF, for interconnection purposes, includes a generator plus an addition or enhancement.

Proposed Change:

6. ~~The definition of GF, for interconnection purposes, includes~~ Even though a stand-alone storage system may, itself, constitute a Generating Facility under Rule 21, a generator plus an addition or enhancement is a single Generating Facility for purposes of interconnection.

Conclusion of Law 10:

Comment: To maintain the current methodology under the NEM-MT, the following change would allow interval data comparison of exports to the grid with generation by the renewable energy system, excluding storage, to determine NEM credits.

Current Language:

10. NEM eligible GFs sized at 10 kW or less should be permitted to utilize the GF's DAS reporting data of kWh energy imported and exported to measure the total energy drawn into the GF against the total energy dispatched by the GF on an annual basis to determine a de-rate factor.

Proposed Change:

10. NEM eligible GFs sized at 10 kW or less should be permitted to utilize the GF's DAS reporting data of kWh energy ~~imported and exported to measure the total energy drawn into the GF against the total energy dispatched by the GF on an annual basis to determine a de-rate factor.~~ generated by the NEM-eligible generating facility with which a storage system is associated in lieu of a Net Generation Output Meter. This information can then be used to compare, on an interval basis, the total output from the NEM-eligible generating facility with energy exports to the grid. The lesser of these numbers will determine the NEM credits attributed to the facility in that interval, consistent with the methodology used currently under NEM-MT.

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I. INTRODUCTION

Pursuant to Rule 14.3 of the California Public Utilities Commission's (Commission) Rules of Practice Procedure, SolarCity Corporation (SolarCity) submits these opening comments on Administrative Law Judge MacDonald's Proposed Decision (PD) regarding net energy metering (NEM) interconnection eligibility for storage devices paired with NEM generation facilities.

As one of the leading developers of storage systems paired with solar generating facilities, SolarCity has first-hand experience with the challenges associated with interconnecting storage devices on the customer's side of the utility's revenue meter. SolarCity is an active participant in the State's Self Generation Incentive Program (SGIP), and has several hundred projects that have reserved funding to support customer-side storage installations, all paired with NEM eligible photovoltaic (PV) systems. However, despite the significant traction these systems have gained in the marketplace, at present only a handful have been interconnected. The reasons for this are myriad, but largely revolve around the costs that to date have been effectively imposed by the utilities as a condition of interconnection. The application, and in a number of instances, misapplication of these costs on storage systems seeking interconnection has resulted in extensive delays as developers have sought to work with the utilities to address these issues, and failing that, working through the Commission's process through the instant proceeding. The

issues that have thus far stymied project completion include the imposition of interconnection application fees, excessive and highly variable metering costs to address concerns regarding NEM accounting integrity, and the threat of standby charges, as well as more understandable challenges associated with establishing an interconnection submission and review process for a relatively new technology. While in the months preceding issuance of this PD progress has been made on several fronts,¹ there remain a number of unresolved items that the PD could also address. Given the significant policy interest in storage generally and customer-sited storage specifically, as evidenced by the eligibility of storage on both a stand-alone and paired basis in the SGIP program, the adoption of the Storage Procurement Targets pursuant to Senate Bill (SB) 2514 (which include 200 megawatts of customer-side projects) and the storage carve-outs in the context of the Commission's recent Track 1 and Track 4 procurement authorizations in the Long Term Procurement Planning Proceeding, facilitating reasonably priced and timely interconnection is critical to ensuring that the state is able to make tangible progress toward its storage-related goals.

SolarCity deeply appreciates President Peevey's and Energy Division staff's efforts to address the issues identified in the Assigned Commissioner Ruling issued in October of last year. On a significant number of the issues, the PD provides a reasonable path forward. In particular, SolarCity agrees with the PD's conclusion that NEM systems with storage systems that meet the CEC's definition of an addition or enhancement to a NEM eligible generating facility should be afforded the same protections as the NEM system alone, as required by the NEM statute. SolarCity also finds that to the degree projects are subject to additional metering requirements that capping these costs at \$500 is reasonable. SolarCity also agrees that while greater standardization across safety regimes statewide would be useful, those regimes, which include the Commission's Rule 21 interconnection process, as well as local permitting requirements, sufficiently address the issue of safety. Additionally, SolarCity believes that the sizing limitations the PD would establish are reasonable. SolarCity also fully supports the extension of the timeline to submit incentive claim application forms given the length of time that has passed as the issues addressed in the PD have been litigated through this proceeding.

¹ In the months leading up to the proposed decision, SCE reduced the estimated cost of the NGOM meter from ~\$2900 to ~\$400; and SDG&E determined the utility would not impose standby charges on storage projects paired with on-site renewable facilities.

However, SolarCity respectfully requests a number of substantive changes to the PD to address potentially unintended consequences that could result if the PD is adopted as issued, as well as to resolve several issues that have been left unaddressed. Below we provide detailed discussion of these outstanding issues as well as our suggested modifications to address these concerns.

II. NEM-ELIGIBLE STORAGE PROJECTS THAT HAVE ALREADY SUBMITTED INTERCONNECTION APPLICATION FEES OR THAT HAVE BEEN ASSESSED METERING FEES IN EXCESS OF THE \$500 CAP SHOULD BE REIMBURSED

As noted above, SolarCity agrees with the PD's determination that the protections afforded NEM systems in the form of exemptions from interconnection application fees, supplemental review fees, distribution system upgrade costs, and standby charges should be extended to storage systems in circumstances where the storage system meets the CEC's definition of an addition or enhancement to a NEM-eligible generating system. SolarCity submits this is a matter of law, not policy, and as such, the imposition of those fees on systems meeting the CEC definitions of an addition or enhancement is illegal. SolarCity requests that the PD be modified to ensure that projects that may have already paid these fees or been subject to these charges be reimbursed for these costs. In SolarCity's case, in the interest of meeting customers' reasonable expectations regarding timely interconnection of their projects, the company has submitted and is now submitting interconnection application requests to the utilities for its outstanding storage projects. In order to accept these applications the utilities have required payment of an \$800 interconnection application fee, a fee from which the PD finds these projects should be exempt. These projects should be fully reimbursed for these costs.

Additionally, the PD establishes a cap of \$500 on the metering costs the utilities assess for the deployment of the metering solution they require in order to preserve NEM accounting integrity. SolarCity's storage projects have to date been configured to include a net-generation output meter (NGOM) consistent with what the utilities currently require pursuant to their

respective NEM Multi-Tariff (NEM-MT) provisions of their NEM tariffs.² The cost of this meter, which is owned and maintained by the utilities, varies by utility, but has ranged from approximately \$400 to approximately \$600. To the extent that projects have been assessed and paid charges to meet the utilities' metering requirements that exceed the \$500 cap the PD establishes, the amounts in excess of this cap should be reimbursed.

III. THE ALTERNATIVE APPROACH TO METERING FOR SYSTEMS LESS THAN OR EQUAL TO 10 KW IN SIZE SHOULD BE MODIFIED TO AVOID UNINTENDED CONSEQUENCES

SolarCity appreciates the efforts the PD makes to provide a less onerous metering or other costly technical solution for systems below ten kilowatts, but urges the Commission to retain the intuitive approach already embedded in the NEM Multiple Tariff (NEM-MT) rather than adopting a new and highly ambiguous approach. In general, SolarCity's position has been that requiring rigorous and costly metering to address a highly speculative risk like NEM gaming is unnecessary for customer-side storage systems, and the PD, though not entirely aligned with SolarCity's position that NEM gaming is a de-minimus risk, appears to embrace this practical perspective. However, SolarCity believes that the approach offered in the PD may have adverse unintended consequences and requests that in lieu of this approach, the PD be modified to rely on the methodology currently reflected in the utilities NEM-MT, adjusted to allow for the use of device internal meters, like those typically integrated into an inverter, instead of a utility-owned Net Generation Output Meter, as NEM-MT currently requires. Additionally and importantly, there appears to be significant ambiguity in the PD in terms of what formula is to be used, with the discussion section appearing to indicate the Commission's intent to assess the exports and imports into a "Generating Facility" and Ordering Paragraph 4 assessing exports and imports into the "Storage System". Additionally, the Ordering Paragraph indicates that the alternative approach is available only to single inverter systems, whereas the discussion section appears to extend this approach to two-inverter systems.

Given this ambiguity SolarCity is concerned that under certain interpretations of this formula customers may be forced to, in effect, choose between the benefits they receive for

² See, for example, section 5 of PG&E's NEM tariff for details regarding metering options/requirements for "Multi-Tariff Facilities".

http://www.pge.com/tariffs/tm2/pdf/ELEC_SCHS_NEM.pdf

using their battery systems for legitimate purposes and the NEM value they receive from their solar system via the application of a de-rate factor in any circumstance where they charge their battery system from the grid. This would be highly problematic as it creates disincentives that will stifle, rather than encourage the use of battery systems to address an expanded set of use cases and provide additional value to customers and to the grid.³

SolarCity notes that the issue of accurately accounting for NEM credits in circumstances where systems in addition to a renewable generating facility produce energy behind the meter is already addressed by the utilities under NEM-MT. Indeed, this fact is also recognized by the PD which essentially preserves those existing requirements for systems greater than 10 kW in size. NEM-MT allows for interval metering of the renewable facility alone and comparison of the generation from that facility with energy exported to the grid. Intuitively, under the current arrangement, if generation from a renewable system, like a solar array, exceeds exported energy, then something other than the solar system is producing and exporting energy. Thus, under NEM-MT the NEM credits are capped at the lesser of the export or the production from the renewable generating facility. In the standard arrangement, a utility owned and maintained net generation output meter (NGOM) separately measures the PV system output. This straightforward approach ensures the integrity of the NEM program, and should not be lost. Importantly, it does not create the perverse incentives that may result from the PD's proposal to apply a de-rate factor.

SolarCity submits that rather than establish a new and ambiguous approach that potentially results in significant unintended consequences, addressing NEM gaming is best achieved by preserving the existing methodology under NEM-MT with the one important change

³ Consider, for example, a load-shifting use case. Under this use case a customer would use their storage device to store off-peak energy and then use that cheaper, off-peak energy to serve their onsite loads during high cost peak periods. Both the peak and off-peak periods could occur during periods when a customer's PV system is not producing energy (for example if peak periods shift to later in the day), necessitating the use of grid power. This use case reflects customers responding to time-of-use or demand response incentives in a way that helps reduce strain on the grid and would appear wholly consistent with state policy objectives. However, under the alternative approach detailed in the PD, the NEM credits an onsite solar system that is co-located with the battery system would earn for any energy exported to the grid would appear to be at risk of being de-rated based on the amount of grid energy that was used to charge the battery.

that in lieu of a costly NGOM, systems less than 10 kW be allowed to use the interval meters like those that are typically already integrated into system inverters.

The current requirement for use of a NGOM is fairly costly, even when capped as proposed by the PD. If the NEM credit calculation could instead be done using data from device internal metering, it would address the cost issue without materially impacting the methodology that is currently used to ensure the integrity of NEM accounting and crediting. In the case of the AC-coupled systems that SolarCity currently deploys, the device internal metering, which already exists in most inverters, measures the solar output post-conversion from DC to AC through the inverter and therefore reflects any conversion losses. As a result this data is apples-to-apples relative to the data that would otherwise be provided by a NGOM. Presumably, data provided by an inverter would qualify as a data acquisition system (DAS), given conformance with the PD's description of DAS functionality.⁴

This same basic approach would also work in the context of DC-coupled systems, where both the storage and the solar device sit behind a single inverter with some straightforward adjustments. Our understanding is that a DAS could be placed, or is typically already integrated into these systems, separately measuring DC output of the PV panels. This would over-state the amount of solar production for purposes of NEM crediting under the NEM-MT methodology and therefore would need to be discounted by a conversion loss factor in order to ensure that it represents a truly comparable substitute for data that would otherwise be provided by the NGOM. This conversion loss factor could simply be the Go Solar California listed efficiency rating of the inverter.

IV. THE COMMISSION SHOULD DIRECT THE UTILITIES TO ALLOW CUSTOMERS TO PAY ON A MONTHLY BASIS TO RECOVER METER COSTS IN LIEU OF AN UPFRONT CHARGE

To the degree customers are required to, or opt into, a regime under which they must deploy a utility-owned metering solution, such as a NGOM, the Commission should direct the utilities to include in their advice letters the option to pay for the required metering on a monthly basis. For many customers, particularly those deploying smaller energy systems, up-front costs represent a significant barrier to adoption. Much of SolarCity's success to date in acquiring

⁴ PD, p. 17.

customers is attributable to the ability of the company to provide access to solar systems with minimal or no upfront costs. The same issues exist in the market for energy storage solutions, and thus, to the extent upfront costs can be reduced and substituted for monthly payments it will facilitate market uptake. In developing this alternative, the utilities should be allowed to recover the entire cost of required meters, subject to the \$500 cap, as adjusted to reflect reasonable carrying costs. The time over which customers should be able to pay for these costs should be set such that the monthly payment does not exceed approximately \$10.

V. THE COMMISSION SHOULD CLARIFY THAT RULE 21 PROVIDES FOR STAND-ALONE STORAGE.

SolarCity appreciates the clarification that an energy storage system that is an addition or enhancement to a NEM system is part of the same “generating facility” for purposes of Rule 21. The Commission’s clarification, however, further implies that storage can only be included in the meaning of “generating facility”⁵ when it is paired with a “Generator”^{6,7}. SolarCity is concerned that this “clarification” will create confusion over whether a stand-alone storage facility—i.e., one that is not an addition or enhancement to a renewable electrical generating facility—can interconnect under Rule 21. It is SolarCity’s understanding that the definition in Rule 21 was modified specifically to provide that energy storage, as a stand-alone facility, could be considered a generating facility for purposes of interconnection. SolarCity does not expect that the Commission wishes to foreclose the possibility of stand-alone storage interconnecting under Rule 21, as this option could be of great importance to other ongoing programs related to storage at the distribution level. SolarCity requests that the Commission clarify that storage can fall within the definition of “generating facility” even where it is not paired with eligible renewable generation.

⁵ Rule 21 defines “Generating Facility” as “All Generators, electrical wires, equipment, and other facilities, excluding Interconnection Facilities, owned or provided by Producer for the purpose of producing electric power, including storage.”

⁶ Rule 21 defines “Generator” as “A device converting mechanical, chemical, or solar energy into electrical energy, including all of its protective and control functions and structural appurtenances. One or more Generators comprise a Generating Facility.”

⁷ PD at p. 10.

VI. Conclusion

SolarCity appreciates the opportunity to provide comments on this Proposed Decision and the Commission's efforts to resolve the challenges that NEM-eligible storage projects have faced.

Respectfully submitted at San Francisco, California on May 5, 2014,

By /s/ Jason B. Keyes

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**SolarCity Appendix A: Recommended Changes to Proposed Decision
Findings of Fact and Conclusions of Law**

Findings of Fact

Finding of Fact X (new)

Proposed New Finding of Fact:

X. Application fees and charges have been collected by the utilities that are not aligned with the limitations on fees described in this order, and those fees and charges should be refunded to applicants to align with this order.

Finding of Fact 9:

9. The point of measurement for the de-rate factor is at or near the point where the GF interconnects with the grid or internal power line, such that all AC energy into and out of the GF can be directly measured.

Proposed Change:

9. To determine NEM credits, the energy output from the GF excluding storage shall be measured and compared with exports to the grid. Energy output from the GF excluding storage shall be measured either on the AC-side of an inverter without storage behind the meter, or on the DC-side of the inverter on the GF excluding storage, then adjusted to AC to reflect inverter losses. The point of measurement for the de-rate factor is at or near the point where the GF interconnects with the grid or internal power line, such that all AC energy into and out of the GF can be directly measured.

Conclusion of Law X (new)

Proposed New Conclusion of Law:

X. The utilities should refund application fees and charges have been collected prior to issuance of this order that would not have been permitted had this order been in place when those fees and charges were assessed.

Conclusion of Law 6

6. The definition of GF, for interconnection purposes, includes a generator plus an addition or enhancement.

Proposed Change:

6. ~~The definition of GF, for interconnection purposes, includes~~ Even though a stand-alone storage system may, itself, constitute a Generating Facility under Rule 21, a generator plus an addition or enhancement is a single Generating Facility for purposes of interconnection.

Conclusion of Law 10:

10. NEM eligible GFs sized at 10 kW or less should be permitted to utilize the GF's DAS reporting data of kWh energy imported and exported to measure the total energy drawn into the GF against the total energy dispatched by the GF on an annual basis to determine a de-rate factor.

Proposed Change:

10. NEM eligible GFs sized at 10 kW or less should be permitted to utilize the GF's DAS reporting data of kWh energy ~~imported and exported to measure the total energy drawn into the GF against the total energy dispatched by the GF on an annual basis to determine a de-rate factor.~~ generated by the NEM-eligible generating facility with which a storage system is associated in lieu of a Net Generation Output Meter. This information can then be used to compare, on an interval basis, the total output from the NEM-eligible generating facility with energy exports to the grid. The lesser of these numbers will determine the NEM credits attributed to the facility in that interval, consistent with the methodology used currently under NEM-MT.