



FILED
10-02-17
04:59 PM

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

Order Instituting Rulemaking to Develop a
Successor to Existing Net Energy Metering
Tariffs Pursuant to Public Utilities code
Section 2827.1, and to Address Other issues
Related to Net Energy Metering.

Rulemaking 14-07-002

**RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E),
SOUTHERN CALIFORNIA EDISON COMPANY (U 338 E) AND
SAN DIEGO GAS & ELECTRIC COMPANY (U 902 M)
TO THE PETITION OF THE CALIFORNIA SOLAR ENERGY INDUSTRIES
ASSOCIATION FOR MODIFICATION OF DECISION (D.) 14-05-033
TO ALLOW DC-COUPLED SOLAR PLUS STORAGE SYSTEMS**

RANDALL J. LITTENEKER
STACY W. WALTER

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 973-6611
Facsimile: (415) 973-5520
E-mail: sww9@pge.com

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

JANET S. COMBS
REBECCA A. MEIERS-DE PASTINO

Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, CA 91770
Telephone: (626) 302-6016
Facsimile: (626) 302-6962
E-mail: Rebecca.Meiers.Depastino@sce.com

Attorneys for
SOUTHERN CALIFORNIA EDISON COMPANY

JONATHAN J. NEWLANDER

San Diego Gas & Electric Company
8330 Century Park Court, CP32D
San Diego, CA 92123
Telephone: (858) 654-1652
Facsimile: (619) 699-5027
E-mail: JNewlander@semprautilities.com

Attorney for
SAN DIEGO GAS & ELECTRIC COMPANY

Dated: October 2, 2017

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. DISCUSSION.....	2
A. Use Case 1: No Grid Charging	2
1. Third Party Certification Should be Required	3
2. De Minimis Determination Should be Consistent with the RPS Guidebook.....	3
3. Validation of Compliance	4
a. The Joint Utilities Support a Firmware Solution	4
b. Password-Protected Settings Require Further Exploration.....	4
c. The “Data Solution” is Flawed	5
B. Use Case 2: No Storage Export	5
1. The Joint Utilities Support the use of Non-Export Relays or a Certified Firmware Non-Export- Scheme.....	5
2. Rule 21 Allowance of “Inadvertent Export” is Irrelevant to Preservation of NEM Integrity.....	6
3. Cross Referencing of Storage Charge/Discharge Approach Should not be Adopted.....	7
C. Virtual and Aggregated Net Energy Metering Are Outside the Scope.....	8
D. Calculation of the 10 kW Threshold Should Continue to be Based on Inverter Nameplate Capacity	8
E. The Joint Utilities do not Support Third-Party Metering.....	9
III. CONCLUSION.....	9

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

Order Instituting Rulemaking to Develop a
Successor to Existing Net Energy Metering
Tariffs Pursuant to Public Utilities code
Section 2827.1, and to Address Other issues
Related to Net Energy Metering.

Rulemaking 14-07-002

**RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E),
SOUTHERN CALIFORNIA EDISON COMPANY (U 338 E) AND
SAN DIEGO GAS & ELECTRIC COMPANY (U 902 M)
TO THE PETITION OF THE CALIFORNIA SOLAR ENERGY INDUSTRIES
ASSOCIATION FOR MODIFICATION OF DECISION (D.) 14-05-033
TO ALLOW DC-COUPLED SOLAR PLUS STORAGE SYSTEMS**

I. INTRODUCTION

In accordance with Rule 16.4 of the California Public Utilities Commission (CPUC or Commission) Rules of Practice and Procedure, Pacific Gas and Electric Company (PG&E), on behalf of itself and Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E) (Joint Utilities), submits this response to the *Petition of the California Solar Energy Industries Association for Modification of Decision (D.) 14-05-033 to allow DC-Coupled Solar Plus Storage Systems* filed on September 1, 2017 (Petition or PFM). The Joint Utilities support the goal of the California Solar Energy Industries Association's (CalSEIA's) PFM to seek clarity on how DC¹-coupled photovoltaic (PV) plus storage systems can qualify for the net energy metering (NEM) tariff. This was an issue that the Commission reserved for later consideration in D. 14-05-033.² The Joint Utilities agree with CalSEIA that the time is now ripe for the Commission to provide further guidance on criteria that both maintains NEM integrity and permits certain DC-coupled PV plus storage systems to participate in the NEM program.

¹ Direct current.

² D.14-05-033, p. 21.

II. DISCUSSION

In the Petition CalSEIA outlines two use cases under which they argue DC-coupled systems should qualify for the NEM tariff: 1) No Grid Charging (Use Case 1) and 2) No Storage Export (Use Case 2). The Joint Utilities support this overall approach. If the storage system cannot charge from the grid, the storage can then be considered to be an “addition or enhancement” that is “integrated into the [renewable generating] facility” as outlined in the Renewable Portfolio Standard (RPS) Guidebook³ since all the energy charging the storage device would be from the renewable PV generator. In addition, if it can be guaranteed that the storage system will not be capable of exporting to the grid then it is possible to confirm that any exports to the grid from the DC-coupled PV plus storage system are generated from the PV system—and thus renewable. There are some important nuances however that need to be addressed to make sure that such an expansion of eligibility is consistent with the CPUC’s commitment to maintaining the integrity of NEM and ensuring that NEM subsidies are only provided to renewable energy technologies.⁴ So, while the Joint Utilities agree with CalSEIA’s proposition that the two use cases should qualify for NEM, we urge the Commission to also take into account the importance of having a reliable and cost effective way to ensure that the systems are truly operating as required.

A. Use Case 1: No Grid Charging

With regard to Use Case 1, the Joint Utilities propose requiring vendors to pursue third party certification verifying that the storage device is incapable of charging from the grid. The Joint Utilities support CalSEIA’s proposal that this functionality should be designed into the firmware—in order to ensure that operating parameters cannot easily be changed following installation and approval for NEM participation. The Joint Utilities believe more exploration is needed regarding the password-protected software solution also proposed by CalSEIA and that it

³ *Renewable Portfolio Standard Eligibility*, Ninth Edition, California Energy Commission, January 2017 (RPS Guidebook), p. 40.

⁴ D. 14-05-033, Conclusion of Law 1.

should not be adopted at this time. The Joint Utilities oppose the third proposed “data solution” because it is vulnerable to gaming and would be operationally burdensome to implement.

1. Third Party Certification Should be Required

CalSEIA outlines a “voltage-controlled configuration” that utilizes a device that controls the DC voltage of electricity entering the storage system and restricts the battery from charging below a set voltage.⁵ The Joint Utilities agree that if such a configuration can reliably ensure that power is never imported from the grid, stored in the storage device, and later exported to the grid for NEM credit, then such a system should be eligible for the NEM tariff. However, such an approach is complex and would require additional interconnection review. In an effort to expedite the interconnection process of such systems for the benefit of the customer, the Joint Utilities recommend that the Commission require a third party certification—such as Underwriters Laboratory (UL)—that properly assures that the storage device is incapable of charging from the grid. Such a requirement would help ensure the integrity of NEM is preserved, the interconnection process is smooth, and that the customer can easily check for system eligibility.

2. De Minimis Determination Should be Consistent with the RPS Guidebook

Under the “voltage-controlled configuration” intended to prevent the storage from charging from the grid, CalSEIA states that there are limited instances where the storage should be allowed to charge minimally from the grid. The Joint Utilities point out that the RPS Guidelines allow for *de minimis* charging from the grid for storage that is still considered an addition or enhancement to a renewable generator. So long as the arrangement satisfies the RPS Guidelines, the Joint Utilities can support treatment of the storage as an “addition or

⁵ CalSEIA PFM, p. 6.

enhancement” to the PV within the meaning of those guidelines. In that case, they are treated as a single, renewable generation facility; and would qualify for NEM.⁶

3. Validation of Compliance

After the system has been interconnected with the grid, proper compliance pathways are needed to ensure that the system continues to operate as intended and that only renewable generation receives NEM credits. CalSEIA proposed three different approaches discussed in turn below.

a. The Joint Utilities Support a Firmware Solution

CalSEIA explains that firmware cannot be reprogrammed by customers. They relay that any change to the settings would need to be performed on-site by the original equipment manufacturer (OEM) and that such a revision would void the UL certification for the unit.⁷ The Joint Utilities agree that the firmware solution as described by CalSEIA would provide sufficient assurance that NEM integrity will continue to be maintained. It is also a criterion that could be confirmed by the utilities in reviewing the application for interconnection and would be a standard that would be easy for both customers and installers to understand and follow. The Joint Utilities support this approach.

b. Password-Protected Settings Require Further Exploration

CalSEIA also puts forward a Password-protected software solution.⁸ While the Joint Utilities see that this solution may have promise, further scrutiny and exploration would be required in order to implement this approach. For example, it is not clear what entity would have access to the password and how that process would be managed. Utility control of the password could prove complex to administer (even if less complex than other alternatives). Cost of

⁶ The Joint Utilities note that in this situation, there is no need for the customer to use the metering and billing requirements of NEMMT arrangements, as the facility is considered to be a single (renewable) generator.

⁷ CalSEIA PFM, p. 10.

⁸ Id, p. 10.

administration could prove prohibitive for customers. Also the Joint Utilities have concerns that this software solution may not be consistent with maintaining third party certification (i.e. UL) following alteration. These details would need to be thoroughly investigated and detailed prior to further consideration of such a proposal.

c. The “Data Solution” is Flawed

CalSEIA also proposes a “Data Solution” such that the customer would simply sign an attestation and provide storage charge/discharge data after the fact for validation that no exports from grid charged storage have received NEM credits. The Joint Utilities do not support this approach for two reasons. First, it would be very easy to game such a system. Given the complexity of DC-coupled systems there would be no way to ensure that the system is truly operating in a way that upholds NEM integrity – even if the customer has every intent to do so, much less in cases where changes to the settings are intentional. Second, it would be very administratively burdensome to collect and verify storage charge/discharge and solar production data. This would give rise to significant data validity issues and concerns and the accompanying increase in administrative costs. See further discussion of “data” solutions below.

B. Use Case 2: No Storage Export

With regards to Use Case 2, the Joint Utilities urge the Commission to continue using the guidance provided in D. 14-05-033 requiring that large NEM paired Generating Facilities (GFs) must install a non-export relay on the storage device to ensure the storage device does not export to the grid.⁹

1. The Joint Utilities Support the use of Non-Export Relays or a Certified Firmware Non-Export- Scheme

In this second use case, the DC-coupled system will be configured so that the storage system will be able to charge from the solar system or the grid but it can only discharge to serve onsite load. In this case, any electricity export can be assured to come from solar generation and

⁹ D. 14-05-033, p. 21.

thus be eligible to receive NEM credits. This solution is similar to options available today in the Joint Utilities' NEMMT tariffs. The Joint Utilities agree with this interpretation, but such a configuration relies on having a reliable way to ensure that storage cannot export onto the grid. A non-export relay remains the best and simplest way to ensure this condition and is, thus, the reason why the Commission adopted such requirement in D.14-05-033.¹⁰ But the Joint Utilities recognize that there may be other control schemes to implement this non-export function. Thus, the Joint Utilities urge the Commission to modify this requirement to include certified firmware solutions that provide equal reliability and security.

2. Rule 21 Allowance of “Inadvertent Export” is Irrelevant to Preservation of NEM Integrity

CalSEIA suggests that NEM integrity can be preserved under the scenario where exports to the grid are prevented, even if momentary exports in fact occur. They base this conclusion on the fact that Electric Rule 21 incorporated the concept of “inadvertent export” as allowable for installations in the interconnection section governing “non-exporting” installations. However, this support is misplaced. Rule 21 is developed and administered to provide for the safety and reliability of the distribution grid, and is not an instrument to preserve NEM integrity. The fact that inadvertent export under certain specific circumstances does not create a safety or reliability concern that must be addressed with additional protective equipment cannot be used to support an argument that nonrenewable exports should receive a NEM billing credit. Any export to the grid from storage that can be charged from the grid will not be renewable. Unless the customer is able to implement the rigorous metering and reporting requirements spelled out in the RPS Guidelines¹¹, the exports from the storage cannot be treated as renewable. This Commission should disregard this proposal.

¹⁰ D.14-05-033, p. 21.

¹¹ RPS Handbook, p. 28.

3. Cross Referencing of Storage Charge/Discharge Approach Should not be Adopted

CalSEIA suggests that compliance with the non-export option can be done through what they consider to be straightforward analysis of charge/discharge data from the storage.¹²

CalSEIA suggests that the customer provide storage charge/discharge data for each billing interval. If a comparison of discharge data to exports to the grid show that there are no exports at any time the storage is discharging, then obviously there have been no exports to the grid from the storage unit. The Joint Utilities agree that this is possible to determine, but it leaves several issues open. First, CalSEIA has not addressed what should happen if there *are* exports to the grid during a time the storage unit is discharging? Should the customer be taken off of NEM? For the month, or permanently? Until these questions are addressed as well as the other the other issues discussed below, it is premature to consider this solution.

Second, there are logistical problems that must be addressed. CalSEIA has not indicated what accuracy of metering should be required, what the metering requirements are, where the metering is to be done, or how the data would be processed. Since the storage unit is sharing an inverter with the customer's PV system, presumably the metering would be on the DC side of the shared inverter. Currently, there are no Joint Utility-approved revenue grade DC meters. This means no meters compatible with the utility billing system are available. An alternative data collection would need to be arranged since the Joint Utilities' billing systems are not currently arranged to accept DC data, convert it to AC, and compare it to the customer's export channel.

Finally, there is the issue of who would pay for the upgrades needed if this approach were to be adopted. Implementation of the measurement, data collection, data validation, incorporation in to the billing system, and bill presentation could prove to be cost prohibitive, whether the cost is borne by the customer installing the storage or other ratepayers. While conceptually possible, this option is not "adoption ready". Until all these issues are address it would be premature for the Commission to consider this option.

¹² CalSEIA PFM, p. 13.

C. Virtual and Aggregated Net Energy Metering Are Outside the Scope

Combining virtual net energy metering (VNEM) and net energy metering aggregation (NEMA) generation with storage presents unique issues that were not addressed in D.14-05-033. The Commission is already considering how best to combine storage and PV for VNEM customers.¹³ This issue should not also be addressed here. In general, the Joint Utilities urge that the same concerns regarding preservation of NEM integrity and reasonable methods for administration should guide the Commission in consideration of such proposals as well.

D. Calculation of the 10 kW Threshold Should Continue to be Based on Inverter Nameplate Capacity

The Commission determined that NEM paired storage devices sized at 10 kW alternating current or less could participate in an estimation methodology in order to preserve NEM integrity.¹⁴ CalSEIA proposes that instead of the utilities “relying on the nameplate AC rating” that, “utilities can use the rated discharge capacity of the storage system itself.”¹⁵ CalSEIA elaborates that, “The battery and charge controller are designed to discharge only up to a certain maximum power rating. There is a continuous output rating and a surge output rating, both of which are listed on the manufacturer spec sheet for each specific storage device. The surge output is normally measured in milliseconds, so is not the relevant metric. The continuous output rating is a maximum level under normal circumstances. Utilities should use the continuous output rating value that is listed on the manufacturer spec sheet of the storage device for determining whether a NEM paired storage system is eligible for the estimation methodology.”¹⁶

The Joint Utilities have a number of concerns with CalSEIA’s proposal. First, the current 10 kW inverter nameplate threshold is a simple method to determine eligibility for estimation

¹³ See, Administrative Law Judge’s Ruling Seeking Comments on Use of Energy Storage by Customers on Virtual Net Metering Tariffs, issued on August 14, 2017 in this proceeding.

¹⁴ D. 14-05-033, Ordering Paragraph 5.

¹⁵ CalSEIA PFM, p. 14.

¹⁶ Id.

and leaves no room for interpretation and future disputes. The CalSEIA proposal is far from simple. The Joint Utilities believe it introduces unnecessary complexity to the application process. It discusses charge controller ratings, battery ratings, and inverter rating. Will the application process require determining the lesser of these? the greater of these? or what? to determine whether it meets the 10 kW criteria. This would encumber the interconnection process, require applicants to supply more information and could increase the number of equipment changes that need to be addressed during the interconnection process. The Joint Utilities believe that for transparency and simplicity reasons, the Commission should reject the CalSEIA proposal.

For these reasons, the Joint Utilities urge the Commission to continue to use the shared inverter size as the criteria for assessing the 10kW limit.

E. The Joint Utilities do not Support Third-Party Metering

In general, it is more costly to incorporate data from non-traditional sources into utility billing systems. While this has been done successfully in some cases outside of the energy billing system such as for performance based incentive payments; it is extremely complicated to bring data into the customer billing system in a manner that allows for smooth incorporation into the customer bills and ensures that established standards for meter and billing accuracy are maintained. At this time, the utilities are unable to support addressing the validation issue through use of a third party data collector as proposed by CalSEIA. That simply substitutes one complex difficult data problem with another and this should not be adopted by the Commission.

III. CONCLUSION

The Joint Utilities believe that storage could play a key role in reducing greenhouse gas (GHG) emissions, especially when coupled with renewable generation. However, this contribution has proved elusive.¹⁷ At present, the CPUC should proceed with caution in order to preserve NEM integrity.

¹⁷ See 2014-2015 SGIP Impacts Evaluation, November 2016, p. 1-12.

The Joint Utilities support CalSEIA's proposal, in part, to allow the voltage-control DC-coupled PV plus storage configuration on the NEM tariff once UL certification is obtained for a firmware compliance solution. All other proposals in this PFM should not be adopted for the reasons outlined above. The Joint Utilities appreciate the opportunity to provide these comments on the Petition.

SCE and SDG&E have authorized PG&E to sign this pleading on their behalf.

Respectfully submitted on behalf of the
Joint Utilities,

RANDALL J. LITTENEKER
STACY W. WALTER

By: /s/ Stacy W. Walter
STACY W. WALTER

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 973-6611
Facsimile: (415) 973-5520
E-Mail: sww9@pge.com

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

October 2, 2017

On behalf of PG&E, SCE and SDG&E