

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

ENERGY DIVISION

**RESOLUTION E-4610**  
**September 19, 2013**

**R E S O L U T I O N**

Resolution E-4610. Commission determination authorizing investor owned utilities to implement net energy metering (NEM) aggregation pursuant to Senate Bill 594 (Wolk, 2012).

**PROPOSED OUTCOME:** The Commission finds that allowing eligible customer-generators to aggregate their load from multiple meters, pursuant to Senate Bill (SB) 594 (Wolk, 2012), will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators. Within fourteen (14) days of the issuance of this resolution, Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric (SDG&E) shall each file a Tier 2 Advice Letter revising their Net Energy Metering (NEM) tariffs to enable meter aggregation pursuant to SB 594.

**SAFETY CONSIDERATIONS:** Implementation of NEM meter aggregation pursuant to this Resolution will not impact safety considerations.

**ESTIMATED COST:** No additional cost is associated with this Resolution.

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**SUMMARY**

Existing law requires every investor-owned utility (IOU)<sup>1</sup> to make available to an eligible customer-generator, as defined by Public Utilities (PU) Code 2827, a standard contract or tariff for net energy metering (NEM) on a first-come-first-served basis until the time that the total rated generating capacity used by eligible customer generators exceeds 5% of the electric utility's aggregate

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<sup>1</sup> The IOUs are Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas and Electric (SDG&E).

customer peak demand. Senate Bill 594<sup>2</sup> (Wolk, 2012), authorized an eligible customer-generator with *multiple* meters to elect to aggregate the electrical load of the meters located on the property where the generation facility is located, and on all property adjacent or contiguous to the property on which the generation facility is located, if those properties are solely owned, leased, or rented by the eligible customer-generator. For the three IOUs, the bill conditioned this authorization upon the Commission making a determination that permitting eligible customer-generators to aggregate their load from multiple meters will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators. The bill requires the Commission to make such a determination by September 30, 2013.

This Resolution finds that allowing eligible NEM customer-generators to aggregate their load from multiple meters, pursuant to SB 594, will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators. In making this determination, the Commission authorizes the IOUs to modify their NEM tariffs to implement the meter aggregation provision of the SB 594 legislation and orders them to file advice letters within fourteen (14) days of the issuance date of this Resolution to comply with SB 594.

## **BACKGROUND**

Pursuant to PU Code 2827, NEM customers can use renewable distributed generation (DG) to offset the electricity consumed behind a single onsite meter. SB 594 authorizes an eligible customer-generator with *multiple* meters to elect to aggregate the electrical load of the meters located on the property where the generation facility is located, and on all property adjacent or contiguous to the property on which the generation facility is located, if those properties are solely owned, leased, or rented by the eligible customer-generator.

Pursuant to SB 594, Section 2827(h)(4)(D) of the PU Code now reads:

*This paragraph shall not become operative for an electrical corporation unless the commission determines that allowing eligible customer-generators to aggregate their load from multiple meters will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators. The commission shall make this determination by September 30, 2013. In making this determination, the commission shall*

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<sup>2</sup> Approved by Governor September 27, 2012. Filed with Secretary of State September 27, 2012.

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*determine if there are any public purpose or other noncommodity charges that the eligible customer-generators would pay pursuant to the net energy metering program as it exists prior to aggregation, that the eligible customer-generator would not pay if permitted to aggregate the electrical load of multiple meters pursuant to this paragraph.*

## **DISCUSSION**

**To make the determination required by SB 594, Energy Division focused on answering the following questions:**

- 1) Will the expected revenue obligations for customers who are not eligible customer-generators increase with the implementation of meter aggregation pursuant to SB 594 relative to the expected revenue obligations under the NEM base case (i.e., NEM participation costs without meter aggregation)?
- 2) What are the public purpose program and other non-commodity charges that eligible customer-generators would avoid if permitted to aggregate the electrical load of multiple meters pursuant to SB 594? Will the associated revenue loss be greater in the SB 594 case compared to the NEM base case?
- 3) Will meter aggregation impact other NEM cost categories?

**In answering these questions, Energy Division first notes several key assumptions:**

- 1) NEM penetration is limited by the NEM program cap in PU Code 2827, and is therefore held constant in the base case and the SB 594 implementation case.

SB 594 does not change or raise the NEM cap<sup>3</sup>, which is presently set at 5% of an electric utility's aggregate customer peak demand. The same amount of NEM capacity will be installed regardless of passage of SB 594 -- assuming that the NEM cap will be fully subscribed. As a result of SB 594 implementation, some of

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<sup>3</sup> The statutory definition of the NEM cap is the point where "total rated generating capacity used by eligible [NEM] customer-generators exceeds five percent of the electric utility's aggregate customer peak demand." PU Code 2827(c)(1). In D.12-05-036, the Commission determined that "aggregate customer peak demand" means the sum of individual customers' peak demands.

the capacity under the NEM cap would be developed as NEM meter aggregation projects.

Further, SB 594 does not increase the capacity that an individual customer generator can currently install under NEM (1 MW). Rather, it makes it more convenient and less costly for the customer, since under SB 594 a customer can install a single NEM generator sized to their entire load, rather than multiple systems sized to consumption at each individual meter.

- 2) NEM meter aggregation will likely be utilized primarily to offset the load of non-residential meters, and will increase the proportion of larger NEM projects relative to smaller residential projects.

NEM meter aggregation is likely to be subscribed primarily by agricultural, commercial, industrial, institutional, and government customers who typically have several meters located on one property (as defined in SB 594) under single ownership. Therefore, compared to the base case, SB 594 would likely lead to an increase in the proportion of larger non-residential NEM projects relative to smaller residential projects. This has cost implications that will be further discussed in the next section.

A single DG facility could offset the aggregate load of all the meters of a property that is comprised exclusively of non-residential accounts or a mix of non-residential and residential accounts. In either case, when any meters fall under otherwise applicable rate schedules, the electricity generated by the renewable electrical generation facility shall be allocated to each of the meters in proportion to the electrical load served by those meters.<sup>4</sup> For example, if a DG facility offsets an aggregated multi-meter load that was 90% commercial and agricultural rate schedules and 10% residential rate schedules, the generation is allocated proportionately to the load served by those meters.

NEM meter aggregation could also be exclusively utilized by residential customer generators, but these situations are less likely. An example could be a compound with several separately metered residences all under single ownership.

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<sup>4</sup> SB 594, Section 2827 of the PU Code subparagraph C.

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**Energy Division drew upon the CPUC's previous Cost-Effectiveness Evaluation of NEM, which analyzed the net cost of the NEM program to ratepayers in March 2010<sup>5</sup>.**

Energy Division reviewed the findings of the 2010 NEM Cost-Effectiveness Evaluation as a primary source of information on the non-participant costs of NEM. Several findings from the 2010 study are relevant to this Resolution<sup>6</sup>:

- 1) NEM costs ratepayers approximately \$20 million per year on a 20-year annualized basis for the fleet of solar PV installed through the end of 2008.
- 2) Due to lower non-residential rates, non-residential NEM projects cost non-participating ratepayers comparatively less per kWh of exported generation than residential customers: the levelized net total cost of non-residential NEM facilities averages \$0.03 per kWh-exported, compared to an average \$0.19 per kWh-exported for residential facilities<sup>7</sup>.
- 3) As of 2008, NEM solar non-residential generators supplied approximately 56% of the capacity enrolled in the NEM program, but accounted for just 10% of the total cost of the solar NEM program.

**A key conclusion can be drawn from the 2010 study results.**

While the NEM program overall represents a net cost to ratepayers, through SB 594 implementation, the NEM program is likely to be more frequently subscribed by larger DG resources with a lower cost per kWh exported, which result in a lower cost to ratepayers. Therefore, meter aggregation of larger DG systems will likely improve the cost-effectiveness of NEM and lower its overall impact on non-participating ratepayers.

**Avoided public purpose program charges and other non-commodity charges would likely decrease through the implementation of meter aggregation.**

A customer-generator under the NEM base case and the meter aggregation case are exempt from public purpose program (PPP) and other non-commodity charges. PPP charges are largely the same for residential and commercial

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<sup>5</sup> Net Energy Metering Cost-Effectiveness Evaluation ("NEM Cost-Effectiveness Evaluation") (March 2010). [http://www.cpuc.ca.gov/PUC/energy/DistGen/nem\\_eval.htm](http://www.cpuc.ca.gov/PUC/energy/DistGen/nem_eval.htm).

<sup>6</sup> The study includes data through 2008.

<sup>7</sup> NEM Cost-Effectiveness Evaluation, (March 2010), p. 11.

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customers. Many PPP charges are applied as “equal cents per kWh” charges to all classes of customers. For those charges, there would be no difference in revenue loss from having a higher proportion of non-residential to residential NEM systems under SB 594, since the same capacity of NEM systems can reasonably be expected to generate the same total kWh, whether it is serving non-residential or residential customers.

Other PPP charges are applied using a variety of allocation methods, which tend to allocate a greater proportionate burden of PPP charges to the residential class. For these PPP charges, the fact that non-residential customers in general pay lower average rates than do residential customers would indicate that increasing the proportion of non-residential NEM systems under SB 594 would decrease the PPP revenue loss associated with NEM. Thus, when considering both methodologies for assessing PPP charges, it is more likely that SB 594 would actually decrease the PPP revenue loss associated with NEM.

With regard to other non-commodity charges, such as charges for utility distribution services, the fact that non-residential customers in general pay lower average rates than do residential customers, we expect that a higher proportion of non-residential NEM systems under SB 594 would decrease the distribution revenue loss associated with NEM.

Finally, SB 594 does not increase the potential cost shifting from an individual customer. A customer with multiple meters on a single site can currently install multiple systems of different sizes appropriate for their individual meters. The law makes it more convenient and less costly for the customer, but does not increase the potential for reductions in revenues collected from PPPs and other non-commodity charges from NEM.

**SB 594 is not expected to impact other NEM cost categories.**

We do not expect increases in other cost categories compared to the potential costs from the existing NEM rules. Under NEM, utilities may not charge customers for interconnection costs associated with their generation; therefore, these non-recovered interconnection costs are a cost of NEM in both the base case and SB 594 case. Some NEM systems under SB 594 will be sized larger than they otherwise would be under the NEM base case. Nevertheless, it is not clear that interconnecting a single large system, rather than multiple small systems of equivalent total capacity would result in increased costs. Since NEM meter aggregation projects will result in more electrons being exported to the grid, there is a possibility that these larger projects could trigger some additional

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transmission and distribution grid upgrade costs. However, because data on NEM interconnection and distribution upgrade costs is extremely limited, and highly dependent upon locational factors, there is not enough information at this time to determine whether a single large installation would result in more distribution upgrade costs than would multiple small systems located in close proximity<sup>8</sup>.

**The following is a summary of the impact of meter aggregation pursuant to SB 594:**

- Under the worst case scenario, SB 594 will have no affect on the net cost of NEM.
- Under the best case scenario, SB 594 will lower the net cost of NEM.
- Aggregation of multiple meters behind larger DG systems will improve the cost-effectiveness of NEM by enabling larger and more efficient installations with a lower cost per kWh exported, which would result in a lower cost to ratepayers.
- Eligible customer-generators, if permitted to aggregate the load of multiple meters, will avoid some PPP and non-commodity charges, but the associated revenue loss in the SB 594 case is less than in the base case of NEM without aggregation.

**The 2013 NEM Cost-Effective Study results are not available at the time of this draft Resolution.**

Pursuant to Assembly Bill (AB) 2524 (Bradford, 2012), the Commission is required to complete an updated cost-benefit analysis of the NEM program by October 1, 2013. That study is underway and scheduled to be completed by this deadline.

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<sup>8</sup> In the 2010 NEM Cost Benefit Study interconnection costs were not included in the base case analysis, because only one of three utilities provided interconnection cost data as part of their data request response for the study. Interconnection costs were included in a sensitivity analysis case and were \$0.012 per kWh. The data provided did not distinguish between residential and non-residential NEM interconnection costs.

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## **COMMENTS**

On September 5, 2013, opening comments were filed by SDG&E, PG&E, SCE, the City of San Diego, California Energy Storage Alliance (CESA), Joint Agricultural Parties, Division of Ratepayer Advocates (DRA), El Dorado Irrigation District (EID), Vote Solar Initiative (Vote Solar), Solar Energy Industries Association (SEIA), and Interstate Renewable Energy Counsel, Inc. (IREC). On September 9, 2013 reply comments were filed by SDG&E, PG&E, SCE, Recolte Energy, and California Farm Bureau Federation, Agricultural Energy Consumers Association, The Wine Institute, and California Climate and Agriculture Network ("Agricultural Parties"). On September 10, 2013 letters of support were filed by United Cerebral Palsy and Wendy Kreutzberg.

The authorizing bill SB 594 tasks the CPUC to determine that permitting eligible customer-generators to aggregate their load from multiple meters will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators. Recolte Energy correctly observes that SB 594 does not mandate that the CPUC determine whether cost shifting exists when comparing aggregated DG systems against the cost of NEM, but rather, whether cost shifting exists when comparing aggregated DG systems against the total cost of multiple disaggregated NEM systems..

While the Commission sympathizes with the IOUs' concerns about increased interconnection costs and expenses, they have not furnished any interconnection cost data upon which to conclude that SB 594 would increase costs for non-participating customers. The Commission's conclusion is based on evidence from the 2010 NEM cost benefit study, whereas the IOUs' argument is based on speculation that NEM aggregation may increase interconnection costs. We agree with DRA that more data inputs are needed to inform any future necessary policy changes to balance the interests of both participating and non-participating ratepayers.<sup>9</sup> Thus, as directed by the Energy Division director, the Commission orders the IOUs' to track interconnection cost data based on the actual interconnection costs for all NEM customers, and to report this information one year from the date of Commission adoption of this resolution.

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<sup>9</sup> Comments on Energy Division draft Resolution E-4610 authorizing investor owned utilities to implement net energy metering (NEM) aggregation pursuant to Senate Bill 594 (Wolk, 2012), at 3.

**FINDINGS AND CONCLUSIONS**

1. Senate Bill 594 (Wolk, 2012) authorized an eligible customer-generator with multiple meters to elect to aggregate the electrical load of the meters located on the property where the generation facility is located and on all property adjacent or contiguous to the property on which the generation facility is located, if those properties are solely owned, leased, or rented by the eligible customer-generator.
2. For the three investor-owned utilities, the bill conditioned this authorization upon the Commission making a determination by September 30, 2013, that permitting eligible customer-generators to aggregate their load from multiple meters will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators.
3. Senate Bill 594 does not change or raise the net energy metering cap, which is presently set at 5% of an electric utility's aggregate customer peak demand. The same amount of net energy metering capacity will be installed regardless of passage of Senate Bill 594 -- assuming that the net energy metering program cap will be fully subscribed.
4. Net energy metering aggregation pursuant to Senate Bill 594 will likely be utilized primarily to offset the load of non-residential meters, and will increase the proportion of larger net energy metering projects relative to small residential projects.
5. As of 2008, net energy metered solar non-residential generators supplied about 56% of the capacity enrolled in the net energy metering program, but were responsible for just 10% of the total cost of the program.
6. The 2010 Net Energy Metering Cost Effectiveness Evaluation found that, because of lower non-residential rates, non-residential projects cost non-participating ratepayers substantially less than residential projects per kWh exported to the grid.
7. Avoided public purpose program charges and other non-commodity charges would likely decrease through implementation of meter aggregation.
8. Aggregation of multiple meters behind larger distributed generation systems will improve the cost-effectiveness of net energy metering by enabling larger, more efficient installations with a lower cost per kWh exported, which represent a lower cost to ratepayers.

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9. The Commission finds that, based on key assumptions in the 2010 NEM cost benefit study, allowing eligible customer-generators to aggregate their load from multiple meters will not result in an increase in the expected revenue obligations of customers who are not eligible customer-generators.

**THEREFORE IT IS ORDERED THAT:**

1. Within 30 days of the issuance of this resolution, Pacific Gas & Electric Company, Southern California Edison Company, and San Diego Gas & Electric shall each file a Tier 2 Advice Letter revising their Net Energy Metering (NEM) tariffs to enable meter aggregation pursuant to Senate Bill 594.
2. The advice letters and revised net energy metering tariffs must comply with all provisions of Senate Bill 594 pertaining to meter aggregation, including the provisions that were conditioned on the Commission making the determination contained in this resolution as well as the provisions that were not conditioned on the determination contained in this resolution.
3. The advice letters must be served on all parties to the Rulemaking for the California Solar Initiative, Self-Generation Incentive Program, and other Distributed Generation issues (Rulemaking 12-11-005, and its predecessor Rulemaking 10-05-004).
4. , Within one year of the effective date of this Resolution, the IOUs will submit reports on the costs of interconnection for all NEM customers, as directed by the Energy Division director, which they will begin tracking immediately.

This Resolution is effective today.

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San Diego Gas & Electric/GP

I certify that the foregoing resolution was duly introduced, passed and adopted  
at a conference of the Public Utilities Commission of the State of California held  
on September 19, 2013, the following Commissioners voting favorably thereon:

/s/ PAUL CLANON  
PAUL CLANON  
Executive Director

MICHAEL R. PEEVEY  
President  
MICHEL PETER FLORIO  
CATHERINE J.K. SANDOVAL  
MARK J. FERRON  
CARLA J. PETERMAN  
Commissioners