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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Revisit
Net Energy Metering Tariffs Pursuant to
Decision D.16-01-044, and to Address
Other Issues Related to Net Energy
Metering.

Rulemaking 20-08-020
(Filed August 27, 2020)

SMALL BUSINESS UTILITY ADVOCATES NET ENERGY METERING PROPOSAL



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March 15, 2021

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I. INTRODUCTION

Pursuant to the Joint Assigned Commissioner’s Scoping Memo and Administrative Law Judge Ruling Directing Comments on Proposed Guiding Principles filed with the California Public Utilities Commission (Commission) on November 19, 2020, Small Business Utility Advocates (SBUA) hereby submits this proposal for the successor to the current net energy metering (NEM) tariff.

Paul Chernick (pchernick@resourceinsight.com) will present SBUA’s proposal during the March 23-24 workshop in this matter.

II. SUMMARY

SBUA proposes that rates in a NEM successor tariff (NEM 3.0) should be adjusted by reducing the netting period for residential customers to monthly TOU periods, with exports valued at full marginal costs as determined by the avoided cost calculator or the utility’s most recent rate case. NEM 2.0 rates would remain in effect for customers in disadvantaged communities and small business customers to ensure continued growth of distributed generation (DG) in those customer groups. To enhance the growth and optimal use of storage, the restriction on grid charging of NEM-connected storage systems should be removed, subject to reasonable size restrictions and using a daily TOU netting period.

SBUA’s proposal includes a glide path that the Commission could apply to balance the objectives of continued growth with balancing system costs and benefits. Each customer category could progress from annual, to monthly, and then potentially to daily TOU netting periods at a category-specific pace.

Table 1: Proposed Initial and Final Netting Periods, by Customer Category

Customer Category	Initial Netting Period		Final Netting Period
	No Grid Storage	Storage	
Residential	Monthly	Daily	Daily
Disadvantaged Community	Annual	Daily	Daily
Small Business < 500 kW	Annual	Daily	Daily
Critical Facilities	Annual	Daily	Daily
All Other Non-Residential	Monthly	Daily	Daily
All Systems > 1 MW	Monthly	Daily	Daily

In the NEM 2.0 decision (D.16-01-044), the Commission fully addressed most of the statutory requirements of Section 2827.1, but left questions for further consideration, as follows.

- “... the benefits and costs of the NEM successor tariff to all customers and the electric system are not well characterized at this time.” (Conclusion of law [COL] 22)
- “In order to ensure that the NEM successor tariff is consistent with Commission policy on distributed energy resources, makes use of relevant information about locational benefits and optimal DG resources, and is appropriately aligned with changes to retail rates for residential customers, the successor tariff adopted in this decision should be reviewed in 2019.” (COL 25)

SBUA’s proposal is primarily focused on these unresolved issues and does not revisit issues resolved in NEM 2.0, except as required by the ALJ’s instructions for successor proposals (January 28, 2021).

A. REVIEW OF STATUTORY CRITERIA

(1) Ensure that DG continues to grow sustainably, particularly in disadvantaged communities.

SBUA proposes that the current NEM netting period would remain in effect for California Alternate Rates for Energy Program (CARE) / Family Electric Rate Assistance

Program (FERA) customers and small commercial customers for solar-only installations, with an enhanced offer for solar-plus-storage systems.

(2) Establish terms of service and billing rules.

In general, the SBUA proposal does not include changes to existing terms of service or billing rules, except as respects the netting period and eligibility of NEM-connected storage systems.

(3) Ensure that NEM tariff is based on costs and benefits of the facility.

SBUA has not fully analyzed the costs and benefits of its proposal, as discussed below.

(4) Ensure that the total benefits of the tariff to all customers and the electrical system are approximately equal to the total costs.

SBUA has attempted to utilize the cost-benefit model included in the Lookback Study workpapers to assess the costs and benefits of its tariff design. Due to technical problems with the model, SBUA was unsuccessful.¹ SBUA was unable to construct its own cost-benefit model on the schedule remaining. SBUA's proposal is intended to be directionally consistent with the glide paths included in the NEM Successor Tariff White Paper.

(5) Allow projects greater than one megawatt to be built to the size of onsite load.

This statutory criterion was met by the NEM 2.0 decision (D.16-01-044) and SBUA does not recommend any changes.

(6) Establish a transition period relevant to the July 1, 2017 statutory requirement.

This statutory criterion was met by Commission decision D.14-03-041.

(7) Requirement for a rulemaking proceeding.

This statutory criterion is met by the current proceeding.

¹ SBUA understands that other parties also had technical questions regarding the workpapers. SBUA requested technical assistance from the Energy Division but has not yet received clarification.

B. COMPARISON WITH OTHER OPTIONS

1. Focus on Storage Systems

One of the most significant differences between SBUA's approach and those discussed in the NEM Successor Tariff White Paper is modification to the requirement that NEM-paired storage be charged only from renewable generation was decided in 2014.² Since that decision, California law and Commission policy have changed, and the use of TOU or critical peak pricing (CPP) rates creates an opportunity to better integrate energy storage systems into the electrical grid using NEM tariffs.

SBUA proposes that NEM-paired storage systems be permitted to charge from the grid without restriction, with a daily TOU netting period limiting the benefit of time-shifting grid energy. SBUA's proposal is focused on shifting California's NEM program to a greater focus on storage, in order to anticipate declining costs of battery storage systems, as well as to emphasize NEM deployments in underserved markets. Optimizing the use of NEM-paired storage is consistent with the Commission's rate design and NEM principles and enhances the opportunity for NEM systems to drive down system costs and emissions.

We also highlight the importance of furthering support for customer investment in resilience, particularly for critical facilities. SBUA's proposal would increase the likelihood that nonresidential critical facilities would invest in NEM-paired storage systems, increasing their resilience during power supply disruptions and reducing the utility's challenge to restore service.

2. Maintain Emphasis on Volumetric Rates

The second major difference between SBUA's approach than and those discussed in the White Paper is that SBUA rejects the proposals to shift away from volumetric rates. SBUA

² Decision D.14-05-033, Conclusion of Law 1, p. 34.

views each of the proposals in the White Paper as less economically reducing efficiency, because customers would experience reduced marginal electricity energy prices, reducing their incentive to invest in energy efficiency or exercise care in consumption. Maintaining a focus on volumetric rates, as suggested by the Commission’s Rate Design Principles, will be more effective at reducing system costs and emissions.

SBUA also considered an alternative approach to maintaining the emphasis on volumetric rates, which is likely to be proposed by other parties, of simply reducing the export rate from the current full retail export rate. Under such an approach, a NEM customer might be compensated for exports using a reduced rate (*e.g.*, 90% or 60% of full retail rates) which would be applied to exports during each billing increment (typically, 15 minutes). This approach may have advantages for solar-only systems. For NEM-paired storage systems, however, the reduced export rate would result in a proportionately lower roundtrip rate differential and would not provide an opportunity to net within the TOU period. The smaller differential between rates for charging and discharging and the lack of opportunity to net within the TOU period would provide a smaller economic incentive to install NEM-paired storage systems than SBUA’s proposed NEM 3.0 tariff.

C. IMPORTANT STATUTORY OR POLICY ISSUES

SBUA’s proposal is not fully aligned with the California Energy Commission (CEC) Renewables Portfolio Standard (RPS) Eligibility Guidebook. Currently, the CEC requires that energy storage technologies must be integrated or directly connected to the facility such that “Only generation attributable to the eligible renewable energy resource may be eligible to produce [Renewable Energy Credits, or] RECs.”³ According to the Lookback Study, REC prices

³ California Energy Commission, *Renewables Portfolio Standard Eligibility*, Commission Guidebook, CEC-300-2016-006-ED9-CMF-REV (January 2017), pp. 40-41.

are so unfavorable that customers are unlikely to sell them.⁴ Under SBUA’s proposal, customers will have a choice between RPS credit or maximum flexibility for utilization of NEM-paired storage.

III. FOCUS ON STORAGE AND DISADVANTAGED/NONRESIDENTIAL CUSTOMERS

A. STORAGE SYSTEMS

As noted in the NEM Successor Tariff White Paper, beyond-the-meter (BTM) solar systems produce maximum output before the hours when the system benefits are highest. Battery storage systems can provide significant additional value by storing generation supplied during lower-value midday hours for use during the higher-value evening hours.⁵ With such a shift, storage provides enhanced benefits—particularly generation capacity—compared to the mainly energy and CO₂ reduction benefits of solar power.

Neither the Lookback Study nor the White Paper gave extensive treatment to the effect of NEM tariff restrictions on the benefits provided by storage systems. Storage does appear to reduce net emissions, as summarized by an impact evaluation of storage systems, “System marginal emissions are strongly correlated to utility system costs.”⁶ If utility tariffs are well-aligned with high system cost hours, and if storage systems have high roundtrip (charge cycle) efficiencies, then NEM-paired storage systems are likely to result in lower system emissions and costs.

⁴ Verdant, *Net-Energy Metering 2.0 Lookback Study*, Submitted to CPUC Energy Division (January 21, 2021), p. 72. (Hereafter, “Lookback Study.”)

⁵ Energy and Environmental Economics, and Verdant, *Alternative Ratemaking Mechanisms for Distributed Energy Resources in California*, submitted to CPUC Energy Division (January 28, 2021), p. 11. (Hereafter, “White Paper.”)

⁶ Itron, *2018 SGIP Advanced Energy Storage Impact Evaluation*, submitted to PG&E SGIP Working Group (January 29, 2020), Ch. 5, p. 30.

In spite of the opportunity to lower system emissions and costs, as well as provide customer resiliency, storage is present in fewer than 6% of NEM systems.⁷ Storage systems are particularly rare for lower income and non-residential customers.⁸ Currently, the incremental costs of energy storage are greater than the additional benefits provided by these systems on the NEM 2.0 tariff.⁹ Battery storage system costs are declining rapidly, so designing the NEM 3.0 tariff to optimize storage benefits would enable growth in the number of customers—including small businesses—who deploy NEM-paired energy storage systems.

Since 2014, the Commission has required NEM-paired storage systems to be configured and metered to ensure energy cannot be imported from the grid and then stored for potential export.¹⁰ Since the Commission established its policy regarding NEM-paired storage systems, two relevant policy developments have undercut the rationale for that decision.

- The Commission has methodically transitioned residential customers to time-of-use (TOU) rates. In Decision D.17-01-006, the Commission stated that, “TOU rates should encourage customers to configure their [NEM] systems to generate energy at times that better align with the later-shifted peak periods, *e.g.*, via installation of co-located energy storage.”
- Senate Bill 700 enacted PUC §379.6(a)(1), directing the Commission to “increase deployment of distributed generation and energy storage systems to facilitate the integration of those resources into the electrical grid, improve efficiency and reliability of the distribution and transmission system, and reduce emissions of greenhouse gases, peak demand, and ratepayer costs.”

While TOU rates and the NEM 2.0 tariff provide incentives to use NEM-paired storage systems to achieve better alignment with evening peak periods, optimal use of those storage systems to shift grid power from off-peak to on-peak, even for the customer’s own use, is not permitted.

⁷ Lookback Study, p. 27.

⁸ Lookback Study, pp. 27-28.

⁹ Lookback Study, p. 7.

¹⁰ CPUC Decision D.14-05-033, Conclusion of Law 1, p. 34.

Growth in solar resources on the California Independent System Operator (CAISO) system will need to be paired with comparable amounts of storage capacity. The economic case for this resource investment strategy is already apparent to many of the load serving entities in California and will become more dominant as costs for solar and storage decline. Where solar resources result in power flow back through secondary lines, transformers, feeders and substations, co-locating storage systems with the NEM generation can reduce overloads on that equipment and line losses. A NEM successor tariff that successfully balances costs and benefits of solar-plus-storage systems should be preferable to one that merely discourages uneconomic NEM systems.

B. DISADVANTAGED AND NON-RESIDENTIAL CUSTOMERS

California Public Utilities Code (PUC) §2827.1(b)(1) requires the Commission to ensure that the NEM tariff includes “specific alternatives designed for growth among residential customers in disadvantaged communities.” It appears that California is falling short of meeting that goal, as the Lookback Study found that “areas with higher incomes show higher percentages of NEM installations relative to California’s population,” and that since the implementation of NEM 2.0 tariffs, the adoption rate of NEM systems in disadvantaged communities has shown some decrease.¹¹

Non-residential customers have also largely been absent from participation in the NEM tariff. According to the Lookback Study, even though non-residential systems are roughly five times larger than residential systems,¹² since they represent roughly 2% of the total market,¹³ non-residential systems generate only about 10% of total NEM system output.

¹¹ Lookback Study, pp. 32, 37.

¹² Lookback Study, Figure 3-3, p. 26.

¹³ Lookback Study, p. 25.

Small businesses that own their property are good candidates for NEM systems, particularly with storage. If a small or medium-sized business (SMB) pays its own electric bill, then it is likely to be the property owner. A survey of such SMBs in the nine-county San Francisco Bay Area found that over three-quarters of them owned, managed, and occupied the entire building.¹⁴ Tenants in office buildings or shopping centers will need to work with the property manager to benefit from NEM systems; program design to encourage such collaboration is beyond the scope of this proceeding.

Thus, in order to “ensure equity among customers” as promoted by Guiding Principle B, the NEM successor tariff should enhance the opportunity for growth in NEM systems serving disadvantaged and non-residential customers, especially small businesses.

IV. PROPOSED NEM TARIFF RATE DESIGN¹⁵

SBUA proposes that rates in the NEM successor tariff (NEM 3.0) reduce the netting period for residential customers to monthly TOU periods, with net exports over the netting period valued at full marginal costs.¹⁶ NEM 2.0 rates would remain in effect for customers in disadvantaged communities and small business customers to ensure continued growth of distributed generation in those underserved customer groups. To enhance the growth and optimal use of storage, the restriction on grid charging of NEM-connected storage systems should be removed, subject to reasonable size restrictions and using a daily TOU netting period.

¹⁴ Applied Energy Group, *BayREN SMB Non-Deemed Market Characterization Study*, CALMAC Study ID BAR0001-01 (July 26, 2018), p. 8.

¹⁵ This section addresses elements a-c, e, i, and k as required in the ALJ order of January 28, 2021.

¹⁶ The avoided costs would generally be determined in the updates to the avoided cost calculator, perhaps supplemented by the marginal costs approved in the utility’s subsequent rate case.

A. NETTING PERIOD

3. Current Netting Process

The manner in which the NEM 2.0 Tariff nets exported power can be described as a three-step process.¹⁷ First, all energy supplied from the grid to the customer is billed based on nonbypassable charges.¹⁸

Second, net electricity use or export is totaled by TOU period on a monthly basis. For each TOU period with net usage, the customer bill reflects a charge for energy use at the applicable retail rate (recalling that the nonbypassable charges are covered in the first step). For each TOU period with net exports to the grid, the customer bill reflects a credit at the applicable retail rate (nonbypassable charges are not included in the export credit).

Thus, the monthly bill reflects payment for all energy imported from the grid at the applicable retail rate, and credits for net exports to the grid. If those the charges and credits (by TOU period) total to a credit, that credit is carried forward to the next month. (The customer's monthly bill also includes a monthly minimum charge for customer costs.)

Third, there is an annual true-up, if the customer produced power in excess of its on-site load over the year and was thus a net exporter to the system. In that case, the customer may be paid "net surplus compensation" at the avoided cost of energy averaged over all 8,760 hours of the year. (This value is roughly 3 cents per kWh.) The true-up, based on net energy export, replaces the dollar-based cumulative year-end credit.

¹⁷ The description is for rates without a demand charge.

¹⁸ Nonbypassable charges were determined to be the Public Purpose Program Charge; Nuclear Decommissioning Charge; Competition Transition Charge; and Wildfire Fund (formerly, Department of Water Resources Bond) charges in D.16-01-044.

4. SBUA Proposed Netting Process and Rates

SBUA proposes that customer groups be migrated to either monthly or daily netting based on TOU periods, with net exports to the grid valued at the full avoided cost of energy.

- For monthly netting, net exports to the grid would be reflected as a credit at the applicable full avoided cost rate for the TOU period, rather than the applicable retail rate used in the current NEM 2.0 tariff. The avoided cost rate would include all components.
- For daily netting, net daily exports to the grid would be reflected as a credit at the applicable full avoided cost rate for the TOU period, rather than the applicable retail rate. When a TOU period continues past midnight and thus extends across two days, the credit would be determined at the end of the TOU period (not at midnight).

Treatment of nonbypassable charges would not be affected. An example of daily netting is provided in Table 2.

Table 2: Example of Daily Netting Calculation

	Hour	Customer Load		NEM Generation		Customer Net Load	
		Hourly	Daily TOU Period	Hourly	Daily TOU Period	Hourly	Daily TOU Period
Off-Peak	6	1.45		0.00		1.45	
	7	1.65		0.00		1.65	
	8	1.78		0.17		1.61	
	9	1.83		0.63		1.20	
	10	1.87		0.58		1.29	
	11	1.88		0.36		1.52	
	12	1.88		2.09		- 0.21	
	13	1.83		1.52		0.31	
	14	1.79		1.03		0.77	
	15	1.80	17.76	2.22	8.59	- 0.42	9.17
On-Peak	16	1.96		0.22		1.74	
	17	2.34		0.00		2.34	
	18	2.49		0.00		2.49	
	19	2.39		0.00		2.39	
	20	2.31	11.49	0.00	0.22	2.31	11.27

Netting over a multi-hour TOU period (rather than an hour or a 15-minute billing increment) would present customers with reasonable pricing signals. Short-term fluctuations in individual customers' net load, as refrigerators and air conditioners switch on and off, have little

effect on generation Loss of Energy Expectation (LOEE) or cost, or distribution overloads, which are significant over multiple hours. A very short-term netting period would encourage customers to waste their effort and money on enabling technologies (storage and automatic controls) to smooth out inconsequential variation.

In contrast, using daily TOU period netting could be more compatible with management of load and storage. The use of daily TOU period netting should generally reflect system economics more accurately than a 15-minute billing increment.

Credits would continue to be carried forward with the potential for excess power generation to be credited using the current “net surplus compensation” method during the annual true-up.

SBUA calculated the export compensation rate using the current Avoided Cost Calculator and including all cost elements. SBUA recommends this approach, rather than the avoided energy rate used in the Net Surplus Compensation (NSC) calculation so that exports are compensated commensurate with the time of delivery to the grid, reflecting all applicable avoided costs. The NSC rate would continue to be used for the annual true-up, where it is not practical to determine the hours in which the solar exports occurred. SBUA would also support the use of utility-specific marginal costs as determined in the most recent General Rate Case in lieu of some or potentially all components of avoided costs.

The impact of SBUA’s proposed netting process is illustrated in Table 3 for an SDG&E coastal zone customer load shape obtained from the Lookback Study model workpapers. The NEM generation is an 8 kW solar system without storage, also obtained from the Lookback Study workpapers. SBUA used SDG&E’s current TOU-DR1 rates (effective March 1, 2021) to

calculate the billing results. The table summarizes the total annual bill, including minimum customer charges and net surplus compensation.

Table 3: Annual Electric Bills Under NEM Billing Scenarios, SDG&E TOU-DR1 Rate

	Minimum Bill	Baseline Allowance	Nonbypassable Charge	Energy Charge	Export Credit	Total
NEM 2.0	125.93	(87.65)	175.58	3,440.66	(3,267.24)	\$ 431.18
Monthly Netting	125.93	(87.65)	175.58	1,731.57	(303.77)	\$ 1,641.65
Daily Netting	125.93	(87.65)	175.58	2,881.28	(436.47)	\$ 2,658.66
No NEM System	125.93	(270.24)	309.83	5,948.44	Not Applicable	\$ 6,113.96

Notes: The baseline allowance and nonbypassable charge are broken out from the energy charge for clarity. The baseline allowance is a rate credit for a baseline level of net energy consumption. Nonbypassable charges may be underestimated due to load data being provided on an hourly (rather than 15-minute) basis. Nonbypassable charges are assessed on the billing increment, which may be 15 minutes for some customers, resulting in inapplicable netting when hourly data are used instead. For the NEM 2.0 case, the total does not reflect the sum of the columns because the Net Surplus Compensation (NSC) adjustment is not shown. The NEM 2.0 customer would have a net credit of \$57.43 at the end of the true-up period, but the payment to the customer is limited to the NSC which is only \$13.52.

The bill savings shown in Table 3 indicate that the modeled customer's bill savings would be reduced by \$1,210 (21%) using monthly netting and \$2,227 (39%) using daily netting. The results would vary by utility and by customer characteristics such as standard tariff, climate zone, size of PV system, and load shape.¹⁹

B. NEM-PAIRED STORAGE

SBUA proposes that NEM-paired storage systems be permitted to charge from the grid without restriction, utilizing a daily netting period. Commission policy currently requires NEM-paired storage systems to be configured and metered to ensure that NEM credit can only be earned by eligible renewable electric generation, and not using grid-supplied power from storage. Since that decision, California law and Commission policy have changed, and the use of TOU or

¹⁹ The Lookback Study paper workpapers did not include PV system output for other customer characterizations, and the model functionality failed to execute on SBUA's consultant's system. SBUA was unable to obtain alternate data and modeling capability in time to meet the filing deadline.

CPP rates creates an opportunity to better integrate energy storage systems into the electrical grid using NEM tariffs.

SBUA proposes that customers who install NEM-paired storage systems would have a choice. The customer could choose to configure and meter the NEM-paired storage system to ensure that NEM credit could only be earned by eligible renewable electric generation and would then be treated in the exact same manner as any customer who does not have NEM-paired storage.

Customers could alternatively choose a simpler configuration for their storage system that would allow charging from either the NEM generation or the grid, such that:

- The storage system would not comply with California Energy Commission (CEC) RPS eligibility guidelines, making the entire system ineligible for RPS credit; and
- All *generation* (non-storage) resources utilized under a NEM tariff would still need to meet the CEC RPS eligibility guidelines, notwithstanding ineligibility for RPS credit.

Customers choosing to charge from the grid would be required to utilize daily netting to maximize system benefits from this more flexible option.

To provide customers with an economic benefit from daily use of NEM-paired storage, the value differential between charge and discharge needs to be substantial. Tables 4, 5 and 6 estimate the differential for customers on each IOU's standard residential TOU rate who charges in the lowest-price period and discharges in the highest-price period for the day. SBUA's proposal would roughly double the potential differential during the summer and provide a much larger differential during the winter.²⁰

²⁰ As discussed elsewhere in this proposal, SBUA's consultant identified technical issues with the Lookback Study workpapers. SBUA's consultant was not able to develop a model to indicate participant or system impacts of SBUA's proposal by the filing deadline.

In addition to roughly doubling the maximum potential differential, SBUA's proposal would allow customers to charge NEM-paired storage from the grid. While SDG&E's rate schedule would favor uneconomic nighttime charging, both PG&E and SCE offer their lowest rates during the morning when solar generation minimizes net load. The charge/discharge differential is significantly smaller when NEM-paired storage is charged from the grid rather than the customer's generation.

Table 4: PG&E, Charge-Discharge Differential NEM 2.0 vs SBUA Proposed NEM 3.0, E-TOU-C Rate²¹

	Summer	Winter
Charge battery from solar, reducing NEM credits at off-peak retail rate	(0.356)	(0.304)
Discharge battery to reduce consumption during on-peak hours	0.418	0.321
NEM 2.0 Differential	\$ 0.063	\$ 0.017
Charge battery from solar, reducing export at off-peak avoided cost rate	(0.068)	(0.052)
Discharge battery to reduce consumption during on-peak hours	0.418	0.321
SBUA Proposed NEM 3.0 Differential	\$ 0.351	\$ 0.269

Table 5: SCE, Charge-Discharge Differential NEM 2.0 vs SBUA Proposed NEM 3.0, TOU-D 4-9 PM Rate²²

	Summer	Winter
Charge battery from solar, reducing NEM credits at off-peak retail rate	(0.269)	(0.258)
Discharge battery to reduce consumption during on-peak hours	0.430	0.371
NEM 2.0 Differential	\$ 0.161	\$ 0.113
Charge battery from solar, reducing export at off-peak avoided cost rate	(0.068)	(0.052)
Discharge battery to reduce consumption during on-peak hours	0.430	0.371
SBUA Proposed NEM 3.0 Differential	\$ 0.362	\$ 0.312

²¹ PG&E Schedule E-TOU-C (March 1, 2021).

²² SCE Schedule TOU-D (February 1, 2021).

Table 6: SDG&E, Charge-Discharge Differential NEM 2.0 vs SBUA Proposed NEM 3.0, TOU-DR1 Rate²³

	Summer	Winter
Charge battery from solar, reducing NEM credits at off-peak retail rate	(0.357)	(0.410)
Discharge battery to reduce consumption during on-peak hours	0.604	0.421
NEM 2.0 Differential	\$ 0.247	\$ 0.011
Charge battery from solar, reducing export at off-peak avoided cost rate	(0.068)	(0.052)
Discharge battery to reduce consumption during on-peak hours	0.604	0.421
SBUA Proposed NEM 3.0 Differential	\$ 0.536	\$ 0.369

C. APPLICATION OF SBUA PROPOSED NETTING PROCESS TO CUSTOMER GROUPS

As discussed above, in order to “ensure equity among customers” as indicated by Guiding Principle B, the NEM 3.0 Tariff should enhance the opportunity for growth in NEM systems serving disadvantaged and small businesses. As solar and storage are more widely implemented for these customer groups, the Commission can adjust the net-metering rules to balance continued growth with system costs and benefits.

As shown in Table 7, SBUA recommends that customers meeting disadvantaged community standards, small businesses, and critical facilities²⁴ (without NEM-paired storage systems) should remain on the annual TOU netting period. However, to better balance system costs and benefits, residential, large commercial, and any customers with systems larger than 1 MW (but without NEM-paired storage systems) should be switched to a monthly netting period. As discussed in the previous section, customers who choose to utilize grid-supplied power for charging would use daily TOU period netting.

²³ SDG&E Schedule TOU-DR1 (March 1, 2021).

²⁴ SBUA recommends the Commission define critical facilities using the list adopted by D.19-05-042 or in subsequent decisions. As the Commission discussed in D.21-01-018, modifications to the critical facility list should be pursued through the avenues contemplated under D.19-05-042, as deviations from that list would create regulatory confusion and uncertainty.

SBUA further recommends that the Commission conduct periodic review category to determine when equitable growth for each customer category may be maintained using a shorter netting period. As shown in Table 7, each customer category would progress from annual, to monthly, and then to daily netting periods at a category-specific pace. SBUA suggests that this could be done on a statewide basis, but there may be good cause to allow differences across the three IOUs.

Table 7: Proposed Initial and Final Netting Periods, by Customer Category

Customer Category	Initial Netting Period		Final Netting Period
	No Grid Storage	Storage	
Residential	Monthly	Daily	Daily
Disadvantaged Community²⁵	Annual	Daily	Daily
Small Business < 500 kW	Annual	Daily	Daily
Critical Facilities²⁶	Annual	Daily	Daily
All Other Commercial	Monthly	Daily	Daily
All Systems > 1 MW	Monthly	Daily	Daily

SBUA includes the category of critical facilities due to the proceedings such as SGIP (R.20-05-012) and Microgrid Commercialization (R.19-09-009) in which the Commission is considering measures to encourage customer investment in resilience, particularly for critical facilities. SBUA’s proposal would increase the likelihood that nonresidential critical facilities would invest in NEM-paired storage systems, increasing their resilience during power supply disruptions and reducing the utility’s challenge to restore service.

Virtual Net Energy Metering (VNEM) and NEM Aggregation (NEMA) systems should be treated similarly to behind-the-meter NEM. For example, residential VNEM or NEMA

²⁵ Including customers on CARE or FERA rates, and NEM-qualified systems funded through SASH, MASH, and SOMAH. SBUA has not analyzed whether it would be appropriate to include customers on Green Tariffs.

²⁶ SBUA recommends the Commission define critical facilities using the list adopted by D.19-05-042 or in subsequent decisions. As the Commission discussed in D.21-01-018, modifications to the critical facility list should be pursued through the avenues contemplated under D.19-05-042, as deviations from that list would create regulatory confusion and uncertainty.

systems without storage should be transitioned to a monthly TOU netting period unless the customers or the system qualifies under the disadvantaged community category.

V. RETAINED AREAS OF EXISTING NEM TARIFF²⁷

SBUA is not proposing any changes to the following elements of the NEM 2.0 Tariff.

- Interconnection fees should continue to be assessed on the same basis and waived for certain low-income and disadvantaged customers.
- NEM systems should continue to be exempt from standby charges.
- Generation from NEM systems should not be subject to any departing load charges, although nonbypassable charges should continue to be applied to all grid-supplied power irrespective of exported power used for netting credit.
- Systems 1 MW or larger should continue to be treated identically to smaller systems and interconnection costs should continue to be project-specific, except that a monthly netting period should be used for non-storage systems, irrespective of customer category.
- Other than application of monthly netting periods, special rules and methods for net energy metering aggregation and virtual net energy metering should be maintained.
- Requirements under Rule 21 (e.g., smart inverters) are not affected by SBUA's proposal.
- SBUA has not identified any new safety issues that should be addressed in its Proposed NEM 3.0 tariff.

VI. GUIDING PRINCIPLES

(a) A successor to the net energy metering tariff should comply with the statutory requirements of Public Utilities Code Section 2827.1.

Compliance with PUC §2827 is addressed in Section I as directed by the ALJ ruling.

(b) A successor to the net energy metering tariff should ensure equity among customers.

As discussed in Section II(B), the NEM 3.0 Tariff should enhance the opportunity for growth in NEM systems serving disadvantaged and non-residential customers, especially small businesses.

²⁷ This section addresses elements d, f-h, and j as required in the ALJ order of January 28, 2021.

- (c) A successor to the net energy metering tariff should enhance consumer protection measures for customer-generators providing net energy metering services.**

SBUA supports this principle and looks forward to reviewing other parties' proposals to address consumer protection issues.

- (d) A successor to the net energy metering tariff should fairly consider all technologies that meet the definition of renewable electrical generation facility in Public Utilities Code Section 2827.1.**

SBUA has not identified any concerns with unfair treatment of specific generation technologies under the current tariff.

- (e) A successor to the net energy metering tariff should be coordinated with the Commission and California's energy policies, including but not limited to, Senate Bill 100 (2018, DeLeon), the Integrated Resource Planning process, Title 24 Building Energy Efficiency Standards, and California Executive Order B-55-18.**

Focusing on enhancing the economics of NEM-paired battery storage systems advances the objectives of the Commission and California's energy policies, as discussed throughout our proposal.

- (f) A successor to the net energy metering tariff should be transparent and understandable to all customers and should be uniform, to the extent possible, across all utilities.**

SBUA believes that the adjustment to the netting period will be reasonably understandable to all customers and requires no differential treatment across utilities. SBUA looks forward to reviewing other parties' proposals to increase transparency.

- (g) A successor to the net energy metering tariff should maximize the value of customer-sited renewable generation to all customers and to the electrical system.**

Focusing on enhancing the economics of NEM-paired battery storage systems will give customers a greater opportunity to maximize the value of customer-sited renewable generation.

The benefits will be shared with all customers and to the electrical system by increasing demand during off-peak periods and increasing net exports to the system during on-peak periods.

(h) A successor to the net energy metering tariff should consider competitive neutrality amongst Load Serving Entities.

SBUA has not identified any issues with respect to competitive neutrality in its proposal but is interested in understanding other parties' views on this issue and addressing any concerns.

VII. RATE DESIGN PRINCIPLES

SBUA believes that the Commission's rate design principles are an essential expression of the Commission's policies in this proceeding. In designing its proposal, SBUA found the following five principles to be of the greatest relevance.

4. Rates should encourage conservation and energy efficiency.

5. Rates should encourage reduction of both coincident and non-coincident peak demand.

Based on Principles 4 and 5, SBUA recommends against the use of demand charges as suggested in the NEM Successor Tariff White Paper. Non-coincident demand charges, applied to the highest customer load in the month or in a broad peak period, dampen price signals for conservation, promote inefficient customer behavior, encourage customers to waste storage resources chasing their maximum loads, and undermine customers' ability to control electricity costs.

A demand charge provides little or no incentive for most individual customers to take actions that reduce system costs. Generation capacity costs are driven by coincident load, not the individual customers' maximum demands which occur at a range of times; even the aggregate CAISO peak loads occur at very different times than the adjusted net load. Similarly, distribution equipment costs are driven by the diversified load of all customers sharing the equipment. An individual household or business (except for very large customers) is unlikely to reach its

maximum demand at the same time as the diversified peak on the distribution substation, feeder, or even the line transformer.

Instead, a demand charge would provide an incentive to a customer to control load at the time that the customer reaches its maximum monthly net demand, even in low-load months. In fact, some customers will likely respond to a demand charge by shifting loads from their own net peak to the peak hour on the generation and local distribution system, thereby increasing their contribution to critical loads and further stressing the system during peak periods.

Demand charges would also result in customers using NEM-paired storage systems to chase their billing demand, rather than shift load out of peak periods. A customer may use storage to shift load off its maximum demand hour (which may be outside the on-peak period) into the on-peak period. At best, balancing these incentives will dilute the effectiveness of the use of storage. At worst, customers will ignore system conditions in operating their storage, or simply abandon the idea of adding storage capacity.

Commission Rate Design Principle 5 has been interpreted by the Commission in 2018 as, “Heavy reliance on non-coincident demand charges is generally disfavored by our historic rate design principles because non-coincident demand charges do not reflect cost causation for primary distribution, transmission, or generation capacity costs.”²⁸ Similarly, in 2017, the Commission wrote that its increasing “reliance on time dependent rates ... would be inconsistent [with an] increase [in] our use of noncoincident demand charges which are non-time dependent.”²⁹ And in the NEM 2.0 Decision (D.16-01-044), the Commission discussed demand charges in the context of exempting NEM customers from standby charges, stating that both standby and demand charges could have a “potentially significant economic impact on the

²⁸ D.18-08-013, Conclusion of Law 56.

²⁹ D.17-08-030.

customer,” and would “mirror the difficulty for the typical NEM residential customer of understanding a demand-like charge.”³⁰

All the same problems described above also apply for a demand charge limited to a broad peak period. Both all-hours and peak-period demand charges fail to encourage energy efficiency. A customer may shift some load out of the peak period in response to a peak period demand charge, or just move load around within the peak. Each customer will be shaping its peak hours in different ways, with one shifting load later in the peak period and another moving load earlier in the peak period. All that reshuffling would likely do little to reduce load in the peak period overall.

Once a customer has experienced a high load, a monthly demand charge give no incentive to control load until the customer’s load approaches that previous value or the next billing month starts, regardless of system conditions in the rest of the month. The monthly demand charge will also encourage customers to waste their storage resources shifting load in months without high generation or distribution costs.

6. Rates should be stable and understandable and provide customer choice.

SBUA’s proposed NEM 3.0 Tariff demonstrates stability because it adjusts only two aspects of net metering—treatment of storage and the netting period. It provides customer choice by allowing customers to choose between retaining RPS credit eligibility for NEM generation, or to fully optimize the use of the NEM-paired storage device to shift load in a manner that benefits the system.

³⁰ D.16-01-044, p. 94.

7. Rates should generally avoid cross-subsidies, unless the cross-subsidies appropriately support explicit state policy goals.

SBUA shares the concerns of many parties that the scale of NEM system implementation is creating pressure on rates for all customers, including small businesses. Accordingly, SBUA recommends reducing the netting period from annual to monthly, for most customers. Furthermore, SBUA recommends reducing the netting period to daily (by TOU period) for customers with NEM-paired storage systems who choose to forego RPS credits and integrate their storage into the grid.

9. Rates should encourage economically efficient decision-making.

SBUA's proposal maintains the same price differentials between TOU (or CPP) periods for all customers. To the extent that periods are well-aligned with costs, then customers would have the economic incentives to align demand with system costs, regardless of whether they have a NEM system.

VIII. IMPLEMENTATION PLANS

SBUA recommends that the Commission should allow for further evaluation of SBUA's proposed NEM 3.0 tariff. As discussed in SBUA's initial and reply comments on the Lookback Study, SBUA and several other parties identified significant issues with meaningful review of the Lookback Study, including common assumptions and facts as well as methods for cost-benefit analyses.

Notwithstanding these concerns, SBUA believes that parties could use the Lookback Study model to provide a common framework for analyzing proposals when submitting testimony.

- Verdant will need to provide a working copy of the Lookback Study model that parties may modify to generate proposal-specific results.³¹
- Verdant should be directed to provide workpapers and modeling capabilities for the storage dispatch algorithms.³²
- The Commission should identify utility-specific tariffs that parties should use to model their proposals in order to minimize confusion based on use of tariffs from different dates. SBUA suggests that one residential and commercial tariff may be sufficient. SBUA has verified that it should be straightforward for Verdant or parties to modify the Lookback Study model inputs to include the additional tariffs.
- The Commission may also wish to suggest specific customer characteristics that each party should include in its evaluation as the Lookback Study model includes a large number of options.
- Parties should be permitted to modify facts and assumptions used in the Lookback Study model and directed to document such modifications.
- Parties should be permitted to modify the calculations of costs and benefits used in the Lookback Study model and directed to document such modifications.

As an alternative to enabling review by parties, the Commission could utilize Verdant or the IOUs to conduct analysis. However, SBUA requests the opportunity to modify the calculations of costs and benefits as discussed in our comments on the Lookback Study.

If SBUA's proposed NEM 3.0 tariff is adopted by the Commission, it could be implemented through Advice Letter filings, as the proposal does not include utility-specific rate calculations or determinations. However, since the proposal will require significant modifications to utility billing systems, SBUA is not in a position to estimate the total anticipated time it will take to fully implement the tariff after Commission adoption.

³¹ SBUA's consultants have some concern that the customer load shapes included in the Lookback Study may be problematic. Verdant should be asked to provide the source and verify key metrics, such as load factor, for each load shape.

³² SBUA was not able to verify whether these capabilities were made available in the model released with workpapers.

IX. COMPARISON WITH OTHER OPTIONS

SBUA does not support the options described in the NEM Successor Tariff White Paper. SBUA disagrees with the paper's assertion that the NEM Tariff should be replaced with a "separately designed rate exclusive to customers with onsite renewable generation."³³ While SBUA's proposed NEM 3.0 rate does include an "exclusive" rate, compensation for net exports at full avoided costs, the proposal continues to allow NEM generation to net against customer load with full retail credit and no additional fees.

The White Paper recommends net billing at a monthly level, with net exports compensated at the avoided cost of energy.³⁴ The White Paper states that to provide efficient price signals, volumetric rate components should be moved gradually towards marginal or avoided costs of service.³⁵ SBUA generally agrees with this concept, but as net billing is shifted towards the daily level, it will be economically inefficient to compensate exports at the avoided cost of energy instead of full avoided costs, as SBUA recommends.

The White Paper recommends a Market Transition Credit (MTC) to provide for a gradual implementation of the NEM successor tariff. SBUA agrees with the intent of the MTC to provide a glide path, but it is not necessary in SBUA's less disruptive proposal. SBUA takes no position on whether the MTC is well designed to moderate the disruption created by the White Paper proposals, because the proposed rate designs should not be adopted. SBUA's proposal has the merit of avoiding all cost recovery issues associated with the proposed MTC.

³³ White Paper, p. 15.

³⁴ White Paper, p. 28. The White Paper does not explain why it recommends using the avoided cost of energy, rather than total avoided costs.

³⁵ White Paper, p. 20. The White Paper also states that the Commission should undertake revenue reconciliation to ensure that class revenue targets are recovered, but does not elaborate on the methods. SBUA generally agrees with the need to undertake revenue reconciliation at the class level.

The White Paper presents four rate design alternatives. SBUA's critique of each rate design alternative is summarized in Tables 8-12.

Table 8: TOU Demand Charges

White Paper Arguments in Favor ³⁶	SBUA Critique
Useful for signaling the higher cost of meeting customer demand in the hours with highest electricity cost. Passing time-variation in capacity value of load reductions can increase economic efficiency in cost collection.	These purposes are better accomplished through well-designed TOU energy rates. See the discussion of demand charge, above.
Provide a source of revenues that is distinct from energy charges.	The value of a "distinct" charge seems to be that the rate would not be subject to netting, much like a nonbypassable charge.
Demand charges defined for a few peak hours provide value for demand-limiting devices or BTM storage.	As discussed above, even peak period demand charges can create inefficient load shifting and do not necessarily reduce peak-period loads.
To mitigate concerns about the impact of occasional load spikes on the bills of residential and small commercial customers, demand charges may be assessed on an average of several maximum demand hours or as a daily on-peak demand charge.	As the White Paper notes, these modifications are functionally similar to a "super peak-period" energy charge. Charges based on the customer's hours of maximum load, rather than the period of high system costs, are not economically efficient.

Table 9: Grid Access Charge (e.g., monthly fixed fee per kW of nameplate solar capacity)

White Paper Arguments in Favor ³⁷	SBUA Critique
Collects the remaining fixed costs, shifting cost recovery away from energy and demand charges. May be set to collect a portion of distribution facilities costs.	Fees of this nature presume that costs of service are "non-avoidable," but in the long run this is rarely the case. Customers who invest in energy efficiency are not assessed a fee for reducing the volumetric use of the distribution system, and it is inequitable to treat customers who utilize NEM generation differently from other low-use customers. This special tax on solar would eliminate some or all of the benefits that the Legislature and Commission have provided to encourage solar deployment.

³⁶ White Paper, pp. 20-21.

³⁷ White Paper, p. 21.

Table 10: Dynamic Rates

White Paper Arguments in Favor ³⁸	SBUA Critique
Dynamic, time-variant rates such as Critical Peak Pricing (CPP) and Real Time Pricing (RTP) more capability to “ration” system capacity compared to TOU rates or demand charges.	SBUA recommends that CPP rates be available as an option to NEM customers and the Commission could consider eventually requiring them for customers with NEM-paired storage. It does not appear that the White Paper is actually recommending dynamic rates as a method to address concerns with the NEM 2.0 rate design.

Table 11: Subscription Rate Models (presented as a variant of the Grid Access Charge)

White Paper Arguments in Favor ³⁹	SBUA Critique
By paying a fixed fee for a maximum demand level, and paying for energy at avoided energy costs, a larger share of costs of service are recovered on a fixed basis.	A subscription rate model could violate several of the Commission’s rate design principles (e.g., Principles 4 and 5) by reducing the marginal price of electricity. See also the discussion of demand charges, above.
Subscription rates allow the customer to monetize long-term investments in energy efficiency or storage “if those investments truly offset grid costs and cost-based subscription fees.”	The White Paper provides no evidence that current rate designs are ineffective at allowing the customer to monetize long-term investments in energy efficiency or storage.

Table 12: Fixed Charge

White Paper Arguments in Favor ⁴⁰	SBUA Critique
Can be set so that the customer bill under the new rate is equal to what the customer would pay under the otherwise applicable rate, assuming a load profile equal to the residential average class loads shape. ⁴¹	Fixed charges reduce the incentive to reduce energy use. The proposed fixed charge would be an unreasonable burden on small customers in each rate schedule and would encourage small customers to install extra solar and storage and disconnect from the grid.

As discussed above, a significant difference between SBUA’s approach and those discussed in the NEM Successor Tariff White Paper is that SBUA proposes that NEM-paired

³⁸ White Paper, pp. 21-22.

³⁹ White Paper, p. 22.

⁴⁰ The White Paper does not specifically identify a higher fixed monthly charge as a rate design alternative, but it uses such an increased charge in its proposed successor rates. White Paper, pp. 24, 28.

⁴¹ White Paper, p. 22.

storage systems be permitted to charge from the grid without restriction, utilizing a daily TOU netting period to avoid excessive credits for stored grid power. SBUA's proposal would shift California's NEM program to a greater focus on storage, in anticipation of declining battery costs and in compliance with State policy, while emphasizing NEM deployments in underserved markets.

While the White Paper asserts that its recommendations provide improved economic incentives for customers to install or operate existing battery storage, as discussed above, those assertions are not supported by any evidence or detailed logic. Subscription or demand charges could provide some incentive for adoption of storage, but not for the efficient dispatch of storage. The disadvantages of such rate designs far outweigh any such incentive they may provide, especially in comparison to SBUA's proposed NEM 3.0 tariff.

The second difference between SBUA's approach than those discussed in the White Paper is that SBUA rejects the proposals to shift cost recovery away from volumetric rates. The proposals in the White Paper would reduce marginal electricity prices, which are the best instrument to ensure that customers respond to the long-term marginal cost of electricity.

SBUA also considered an alternative approach to maintaining the emphasis on volumetric rates, which is likely to be proposed by other parties, of simply reducing the export rate from the current full retail export rate. Under such an approach, a NEM customer might be compensated for exports using a reduced rate (*e.g.*, 90% or 60% of full retail rates) which would be applied to exports during each billing increment (typically, 15 minutes). This approach may have advantages for solar-only systems. For NEM-paired storage systems, however, the reduced export rate would result in a proportionately lower roundtrip rate differential and would not provide an opportunity to net within the TOU period. The smaller differential between rates for

charging and discharging and the lack of opportunity to net within the TOU period would provide a smaller economic incentive to install NEM-paired storage systems than SBUA's proposed NEM 3.0 tariff.

X. CONCLUSION

SBUA thanks the Commission for the opportunity to submit this proposal for the NEM successor tariff.

Respectfully Submitted,

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