BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA



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

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

CALIFORNIA SOLAR & STORAGE ASSOCIATION'S PROPOSAL FOR A SUCCESSOR TO THE CURRENT NET ENERGY METERING TARIFF

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On behalf of the California Solar & Storage Association

March 15, 2021

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Pursuant to Commissioner Guzman Aceves's November 19, 2020 Scoping Ruling and Administrative Law Judge Hymes's January 28, 2021 e-mail ruling ("January Ruling") and March 5, 2021 e-mail ruling,¹ the California Solar & Storage Association ("CALSSA")² hereby submits this proposal for a successor to the current NEM tariff ("Proposal"). Brad Heavner, CALSSA's Policy Director, will present the Proposal at the March 23 and 24, 2021 workshops in this proceeding. Mr. Heavner's e-mail address is brad@calssa.org.

CALSSA proposes a NEM-3 tariff that focuses on revisions to the export compensation rate provided to participating customers, with a reasonable glidepath to lower those rates based on the achievement of deployment targets. While NEM is a tariff that credits customers for energy exported to the grid, its fundamental purpose is to allow customers to take control of their electricity consumption, serve their own loads, and conserve resources. A NEM successor tariff framework must not interfere with a customer's right to self-generate behind the meter. For these reasons, the CALSSA proposals herein focus on revisions to the export credit rate.

The proposed step-down schedule is designed to ensure that the tariff aligns with statutory cost-effectiveness mandates and is equitable for all customers. The Proposal's suite of

¹ R.20-08-020, Joint Assigned Commissioner's Scoping Memo and Administrative Law Judge Ruling Directing Comments on Proposed Guiding Principles (November 19, 2020) ("Scoping Ruling"); R.20-08-020, E-Mail Ruling Introducing White Paper, Noticing Workshop on White Paper, and Providing Instructions for Successor Proposals (January 28, 2021) ("January Ruling"); R.20-08-020, E-Mail Ruling Providing March 23-24 Workshop Preparation Instructions (March 5, 2021) ("March Ruling").

² Per Administrative Law Judge Hymes's request at the prehearing conference, all acronyms used in this Proposal are defined in the attached acronym list, Attachment A.

low-income provisions seeks to substantially increase access to NEM for low-income homeowners, renters, and customers in disadvantaged communities. The proposed consumer experience provisions seek to reduce unexpected end-of-year bills and increase the accuracy of savings estimates.

State policy objectives hinge on the continued development of distributed resources in California. First, the solar industry's network of contractors, suppliers, and related participants provides the only viable path to installing the customer-sited energy storage facilities. Energy storage is absolutely necessary to operate a wildfire-prone grid delivering the high levels of renewable energy needed to meet the State's greenhouse gas goals, and having a substantial portion of that storage at customer locations will help manage distribution circuits as electrification increases load. Those distributed energy storage systems will come on the back of the solar market and its network of contractors, suppliers, and other participants capable of delivering customer-sited energy solutions at scale. If this market crashes before energy storage becomes a mainstream product, it will not be possible to recreate it and take advantage of the associated efficiencies. Limited battery availability and high soft costs for storage projects remain barriers to full-scale storage deployment, and the Commission must allow time for the distributed energy storage market to mature.

Second, meeting the State's greenhouse gas reduction goals through utility-scale renewables alone is not a realistic scenario. Under current IRP modeling, the rate of utility-scale solar development will need to nearly triple and remain at that elevated level every year for the next 25 years. If distributed solar is reduced below current projections, the build rate of utility-scale renewables will need to be even higher. The cost of new transmission that the current IRP portfolio projections would require has not even been studied. Transmission siting will be extremely difficult and, given recent experience with runaway transmission costs, enormously expensive.³ Allowing the pace of distributed solar development to slow will only exacerbate these challenges.

³ Utility Costs and Affordability of the Grid of the Future, p. 37, California Public Utilities Commission (February 2021), available at <u>https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid %20of%20the%20Future.pdf.</u>

Modifying NEM in California will shift the ground beneath local businesses, affect job rolls, and reverberate beyond the State's borders. California, and this Commission in particular, should take pride in the vibrant solar industry it has helped foster. California is *the* nucleus for DERs and DER-related policies. It has grown not only world-class DER companies and global leaders that continue to be policy ambassadors to states across the country, and countries around the world, but also hundreds of small and mid-sized "Main Street" solar and solar-related businesses. The modifications to NEM adopted in this proceeding will affect these smaller companies the most, as well as the 74,000 Californians currently working in the solar industry.⁴ Despite significant accomplishments in growing the solar industry in the State, achieving and maintaining profitability in this highly competitive market remains difficult, with many companies either continuing to report losses or going out of business altogether.⁵ While this Proposal acknowledges a need for the NEM compensation structure to evolve given the current levels of DER deployment in the State, the need for that evolution to be reasoned and measured cannot be understated for these companies and their employees.

I. SUMMARY OF CALSSA'S PROPOSAL

Pursuant to the January Ruling, CALSSA provides this summary of its Proposal.

A. CALSSA's Tariff Proposals

<u>Residential Customers</u>: For general market residential NEM customers, CALSSA proposes a step down of export credits from retail rates in five steps, with the first step down beginning upon implementation of NEM-3. Each step down reflects a percentage of each utility's retail rate, as shown in Table 1.

⁴ *National Solar Jobs Census 2019*, The Solar Foundation (February 2020), https://www.thesolarfoundation.org/national/.

⁵ Peter Eavis and Ivan Penn, *Home Solar Is Growing, but Big Installers Are Still Losing Money*, The New York Times (January 4, 2021), *available at* https://www.nytimes.com/2021/01/04/business/energy-environment/rooftop-solar-installers.html.

Export Step-Down									
	PG&E		PG&E SCE		SDG&E		All IOUs		
								LMI	
		Solar + Solar +			Solar +	CARE/	Multifamily		
	Solar	Storage	Solar	Storage	Solar	Storage	FERA	Renters	
Step 1	90%	100%	95%	100%	90%	95%	100%	100%	
Step 2	80%	95%	90%	100%	80%	90%	100%	100%	
Step 3	70%	90%	85%	100%	70%	85%	100%	100%	
Step 4	60%	85%	80%	100%	60%	75%	100%	100%	
Step 5	50%	80%	75%	100%	45%	65%	100%	100%	

Table 1. NEM Export Value as Percentage Reduction from Retail Rates

The solar and storage deployment thresholds triggering each new step are those in the following table. As the threshold for each step in Table 2 is met, customers receive export credits at the level of the next step in Table 1 above. For example, when the Step 1 capacity threshold is met, customers will take service under the Step 2 value in Table 1.

Step-Down Thresholds								
		Cumulative Residential MW on NEM-3						
	P	PG&E SCE SDG						
	Solar Storage		Solar	Storage	Solar	Storage		
Step 1	770	150	520	100	300	60		
Step 2	1540	460	1040	310	600	180		
Step 3	2310	920	1560	620	900	360		
Step 4	3080 1540 2080 1040 1200 6							
Step 5	Continues until further review							

 Table 2. Capacity Thresholds for Step Transition

Renters and Low-Income Customers: CALSSA proposes the following suite of policies

targeted to increase DER adoption among low-income customers and renters:

- Residential customers with income below 80% of Area Median Income will receive NEM credits at full retail rates, minus non-bypassable charges, equivalent to the structure under the NEM-2 tariff.
- Customers on CARE and FERA rates will receive NEM credits at the same level as the non-CARE rates of their otherwise applicable rate schedule.
- Multifamily rental properties in census tracts with income below 120% of Area Median Income will be eligible for VNEM at full retail rates, minus non-bypassable charges, equivalent to the structure under the current NEM-2 tariff.

<u>VNEM</u>: CALSSA also proposes three provisions to increase the practical feasibility of the VNEM tariff.

<u>Commercial Customers</u>: For commercial customers, CALSSA proposes the NEM-3 tariff be identical to the NEM-2 tariff for commercial customers.

Consumer Experience: CALSSA includes two provisions that are important for effective

implementation of the successor tariff:

- Require NEM customers to pay what they owe at the end of each month, thereby eliminating the potential for large, end-of-year bills that may be unexpected.
- Require the utilities to create a portal that enables contractors to reasonably access customer interval data, thereby increasing the accuracy of savings estimates and reducing project development costs that get passed on to consumers.

B. CALSSA's Proposal Meets the Relevant Statutory Criteria.

The CALSSA Proposal meets the relevant statutory criteria in Public Utilities Code

Section 2827.1. The Proposal lays out a framework for a successor tariff that:

- (1) Ensures customer-sited renewable distributed generation continues to grow sustainably via the use of payback periods for solar that customers find acceptable. Payback periods are generally longer than customers find acceptable on a purely economic basis for storage, but they will improve if incentives are renewed, customers place value on the co-benefit of resilience, and/or if additional revenue sources are developed.⁶
- (2) Includes specific alternatives designed for growth among both single-family and multifamily residential customers in disadvantaged communities.⁷
- (3) Ensures that total benefits of the tariff to all customers and the electrical system are approximately equal to total costs with TRC and RIM values near or above 1.0.⁸

C. CALSSA's Proposals Are Similar to and Different From the E3 White Paper.

There are several key similarities between this Proposal and the E3 white paper:⁹

- The E3 white paper has the same commonsense, plain-meaning read of AB 327 as CALSSA. The law requires sustainable growth of distributed solar, and any changes to NEM must be designed to avoid disruptive swings in the market.
- CALSSA and E3 both include a gradual pace of change.
- CALSSA agrees with E3 that a buy-all, sell-all tariff would be an extreme shift from the *status quo*.
- CALSSA agrees with E3's focus on customer economics and the use of payback period as an important benchmark. Our target of 7 years is close to E3's target of 7.5 years.
- Neither CALSSA nor E3 propose changes to the NEM tariff for commercial customers.

⁶ See Cal. Pub. Util. Code § 2827.1(b)(1), (3).

⁷ See Cal. Pub. Util. Code § 2827.1(b)(1).

⁸ See Cal. Pub. Util. Code § 2827.1(b)(4).

⁹ Alternative Ratemaking Mechanisms for Distributed Energy Resources in California, California Public Utilities Commission (January 28, 2021) ("E3 White Paper").

There are also important differences between this Proposal and the E3 white paper:

- CALSSA uses levelized 25-year avoided costs from the Avoided Cost Calculator. It is blatantly incorrect to use a 2020 snapshot of avoided costs to represent the avoided cost of a 25-year resource. The Avoided Cost Calculator is set up to calculate levelized benefits over the lifetime of a resource. Solar installed in 2022 will be generating through at least 2047, and the greenhouse gas emission reductions in the later years of that period have high value that is ignored when looking only at the 2020 snapshot.
- CALSSA calculates the RIM based on electricity exported from customer sites to the distribution system. This is the component that differentiates NEM from other demandside management programs. E3 calculates the RIM based on exports plus electricity that is produced and consumed behind the meter.
- CALSSA does not propose discriminatory and extreme rate structures. The E3 white paper unreasonably assumes the majority of utility costs are fixed and states that a cost-based residential rate would include a fixed charge of \$177 per month for SDG&E. The median total bill for SDG&E residential customers is \$85 per month.¹⁰ Proposing a fixed charge that is more than twice the amount that half of all customers currently pay is not a credible suggestion.
- E3 presents the concept of a market transition credit to "make up the difference" if technology cost declines do not keep up with declines in NEM tariff compensation over time. The market transition credit is both complex and risky for ratepayers as these costs must be borne by all or a subset of ratepayers. A market transition credit only would ensure the perception, and not the actual reality, that a particular step-down schedule can be achieved. CALSSA proposes that the glidepath toward a vastly different NEM tariff should be managed through gradual changes to the tariff without this additional layer.
- The E3 white paper does not include any elements for low-income customers or renters.
- Data in the white paper on the impacts of changes to NEM in other states hide the actual impacts of those changes.

A full critique of the white paper is not part of this Proposal, but we do address the misleading

nature of the data referenced in the last bullet above in detail in Section VI herein.

D. CALSSA's Proposal Does Not Result in Any Outstanding Issues.

CALSSA's proposals can be implemented via the advice letter process and do not result in any outstanding statutory, policy, or practical issues.

¹⁰ SDG&E Response to CALSSA Data Request to Joint IOUs 2, Question 5. This presumably includes CARE customers, so additional analysis should consider the average non-CARE bill, but \$177 per month still appears to be an incorrect calculation of fixed costs per customer.

II. CALSSA'S PROPOSALS

A. Summary of the Elements in Administrative Law Judge Hymes's January Ruling

Administrative Law Judge Hymes's January Ruling lists eleven elements (a) through (k) that must be addressed by each proposal. While some of these aspects are explained in more detail below, some basic elements are common throughout each proposal and warrant mention here. Specifically, the CALSSA Proposal:

- a. Utilizes net billing;
- b. Calculates export rates based on a measured glidepath from the current retail rate credits to credits based on the Avoided Cost Calculator (except for the low-income, multifamily, and commercial rate proposals, which maintain credit levels at retail rates);
- c. Does not include a requirement that customers take service under any specific rate structure other than time-of-use rates;
- d. Does not end exemptions from interconnection upgrade costs for systems smaller than 1 MW, standby charges, or departing load charges;
- e. Continues the current practice of hourly netting and monthly calculation of NEM credits and includes an eligibility period of 20 years, meaning any customer that installs solar during a particular step will maintain that step for 20 years;
- f. Does not include a cap on system size other than the current rule that systems can be no larger than 110% of recent or expected load;
- g. Does not include any changes specific to NEM aggregation, but does revise VNEM to improve access to NEM for customers in multifamily housing;
- h. Leaves smart inverter requirements unchanged;
- i. Keeps the eligibility of energy storage systems the same as the current rules for NEMpaired storage;
- j. Does not present any safety issues; and
- k. Does not present any legal issues.

B. Proposal for General Market Residential Customers

CALSSA proposes to step down the export credit value for NEM in five steps. The first step down begins upon implementation of NEM-3, and the following four steps begin for each utility when capacity thresholds have been met for solar and storage installed under NEM-3. Each step is a percentage of the current export rate (*i.e.*, reducing the retail rate by a percentage and then subtracting out non-bypassable charges).

The end points of the step downs are designed to approach the 25-year levelized value from the Avoided Cost Calculator using all default inputs. There are several ways to compile

avoided costs from the Avoided Cost Calculator. The calculator produces a different value for every hour of the year. Averages of those hourly values over time-of-use periods could be used as technology-neutral values of distributed energy. CALSSA does not base its Proposal on those averages, but they are shown in Table 3 for informational purposes.

		PG&E Using E-TOU-C TOU Periods	PG&E Using EV2 TOU Periods	SCE	SDG&E
	On-Peak	0.361	0.361	0.653	0.429
Summer	Mid-Peak		0.367	0.340	0.233
	Off-Peak	0.191	0.145	0.212	0.154
	On-Peak	0.202	0.202	0.226	0.212
Winter	Mid-Peak		0.177	0.181	0.168
	Off-Peak	0.153	0.146	0.137	0.146

Table 3. Avoided Costs Averaged by Time-of-Use Period (\$/kWh)¹¹

Further, the hourly Avoided Cost Calculator values could be applied to standard profiles of solar or other resources, with the resulting weighted hourly values binned into time-of-use periods. Or the weighted hourly values could be summed into total annual benefits per total energy production for a single \$/kWh value. Each of these would be a legitimate use of the Avoided Cost Calculator. CALSSA's Proposal is based on weighted hourly Avoided Cost Calculator values according to a standard solar profile and a solar plus storage operating profile that we believe is most typical of energy storage performance.

CALSSA recommends a NEM-3 tariff with export rates as percentages of retail rates that approach avoided costs. The percentages are designed such that the annual \$/kWh value of NEM exports comes within ten percent of the \$/kWh value of exports applied to hourly Avoided Cost Calculator values. This should be done separately for solar and solar plus storage. NEM export value can be reduced by ten percent in Step 1, and then continue to step down over time as gradually reducing percentages of retail rates until the weighted average value of reduced rates reaches 90% of the weighted average avoided cost.

¹¹ Avoided Cost Calculator results for 25-year levelized values with a 2022 start year and all default values. Climate Zone 12 is selected for PG&E and Climate Zone 10 for SCE and SDG&E, corresponding with the sample customers in Stockton, Corona, and San Diego that CALSSA uses throughout this Proposal.

Using data from the NEM-2 Lookback Study produces the percentages in Table 4 below. Table 3-1 of the Lookback Study presented the average NEM-2 solar system size for each of the IOUs and the average post-interconnection electricity consumption for PG&E and SDG&E. The average post-interconnection electricity consumption for SCE can be derived by assuming that the solar system offsets 90% of annual consumption.

Workpapers from Verdant Associates included the customer load data used in the study. Using that customer consumption data and standard solar production projections leads to the Step 5 percentages in Table 4.

Applying a typical solar curve to hourly Avoided Cost Calculator values and percentage reductions in rates, the value is approximately equal at 50% of PG&E E-TOU-C, 75% of SCE TOU-D-4-9, and 45% of SDG&E TOU-DR1. Applying a profile of solar as modified by energy storage in self-consumption operating mode, the value is approximately equal at 80% of PG&E E-TOU-C, the current level of SCE TOU-D-4-9, and 75% of SDG&E TOU-DR1. These percentages are reflected in the last row of Table 4 below and equate to approximately 90% of the weighted average avoided cost.

	PG&E		SCE		SDG&E	
	Solar	Solar + Storage	Solar	Solar + Storage	Solar	Solar + Storage
Step 1	90%	100%	95%	100%	90%	95%
Step 2	80%	95%	90%	100%	80%	90%
Step 3	70%	90%	85%	100%	70%	85%
Step 4	60%	85%	80%	100%	60%	75%
Step 5	50%	80%	75%	100%	45%	65%

 Table 4. NEM Export Value as Percentage Reduction from Retail Rates

CALSSA proposes steps 1-4 in Table 4 as a glidepath to step 5, with the four transitions occurring at the thresholds in Table 5. Each step will remain in effect until a utility reaches the levels of solar and storage adoption identified in Table 5. The thresholds are calculated as twice the average annual installation rate of the past five years. Each step would therefore be in effect for two years if the market remains steady. The storage threshold represents 20% of the solar threshold in Step 1, 40% of the incremental solar threshold in Step 2, 60% in Step 3, and 80% in Step 4.

The step down includes a trigger for both solar and storage because solar adoption is a measure of continuity in the market, and storage market growth is a measure of when the market

will be able to adjust to a tariff with lower payback potential for solar without storage. Both need to be met before a utility changes the NEM tariff to the next step.

As the threshold for each step in Table 5 below is met, customers will receive export credits at the level of the next step in Table 4 above. For example, when the Step 1 capacity threshold is met, customers will take service under the Step 2 value in Table 4.

		Cumulative MW on NEM-3							
	PG&E		SCE		SDG&E				
	Solar	Storage	Solar	Storage	Solar	Storage			
Step 1	770	150	520	100	300	60			
Step 2	1540	460	1040	310	600	180			
Step 3	2310	920	1560	620	900	360			
Step 4	3080	1540	2080	1040	1200	600			
Step 5	Continues until further review								

Thresholds should be based on installed capacity in order to ensure that the market is ready for the subsequent step. Extended time in a step is not a problem because it indicates reduced installation rates. If a step down is mild compared to what the market can bear, the structure will move to the next step quicker than anticipated.

However, having transitions tied to capacity has the disadvantage that customers will not be able to have certainty on project economics when a transition is near. It normally takes a few weeks or a few months between signing a contract for solar installation and having the system installed and approved for operation. If the transition is a moving target it will not be possible for a customer to predict their tariff treatment. The MW threshold should therefore be converted to a date certain as adoption nears the threshold.

Under CALSSA's Proposal, the utilities will track progress toward the threshold and file a Tier 1 advice letter before the threshold is projected to be hit that establishes a firm date for the transition in place of the MW threshold.¹² The date should be at least three months after the advice letter is filed. The methodology for setting the date should be based on the monthly average installation from the prior three months and should use a transparent formula. This

¹² Effectuating step downs via Tier 1 advice letters would be procedurally appropriate, as these tariff changes would be in compliance with the specific requirements of the Commission decision establishing the successor, and the wording of these changes would follow directly from that decision. *See* General Order No. 96-B, Energy Industry Rule § 5.1.

approach would obviously result in the transition happening at a capacity level that is not exactly the same as the defined capacity trigger; but a clear methodology will minimize the difference, and the benefits of avoiding disruption far outweigh precise adherence to a capacity trigger.

C. Proposal for Commercial Customers

The NEM-3 tariff for commercial customers should be identical to the NEM-2 tariff. The shift to evening-peaking time-of-use periods greatly slowed the commercial solar market and the NEM 2.0 Lookback Study notes that on aggregate, nonresidential solar customers more than cover their average cost of service.¹³ PG&E Schedule B-19 Option R, for example, has a summer peak rate of \$0.36/kWh for 4-9 pm and a summer off-peak rate of \$0.12/kWh. Schedule E-19 Option R, in contrast, has a summer peak rate of \$0.26/kWh for 12-6 pm. As evening peaks were implemented, and customers understood they would need to move from the time-of-use periods and rates in E-19 to those in B-19, commercial solar rates abruptly changed from being good for solar to being bad for solar. These impacts can be seen to a limited extent in the following Figure 1:

¹³ *Net-Energy Metering 2.0 Lookback Study*, p. 10, Verdant Associates, LLC (January 21, 2021) ("NEM 2.0 Lookback Study").



Figure 1. Commercial Solar Interconnections¹⁴

While Figure 1 above shows some impacts, interconnection data for commercial customers does not give an accurate picture of new activity in the past year because commercial projects often take a year between contract signing and application submittal, and another year between application submittal and final construction. Many recent commercial solar interconnections are for systems that qualify for TOU period legacy treatment through previous application submittal. The following data shows the number of commercial interconnection applications submitted over the past three years.

¹⁴ California Distributed Generation Statistics, *available at* <u>www.californiadgstats.ca.gov</u>. The annual totals are based on the totals reported in each month. Data for 2020 includes a projection for December because December 2020 data has not yet been released. In some cases, the annual totals are slightly higher than the values currently reported because customers that make material changes to their systems get moved to a new interconnection date.



Figure 2. IOU Interconnection Applications Submitted for Commercial Solar

The NEM Lookback Study found that commercial solar customers pay higher bills after installation of solar than the cost to serve them.¹⁵ Further changes to the NEM tariff for commercial customers are unwarranted, could bring commercial solar installations to a halt altogether and must be avoided. CALSSA would support consideration of ways to improve NEM for commercial customers.

D. Proposal for Low-Income Customers and Tenants of Multifamily Properties

Three relatively simple provisions can boost installations for low-income customers and renters:

1. Allow low-income customers in single-family homes to be eligible for a tariff that is equivalent to NEM-2;

- 2. Credit exports from CARE and FERA NEM customers at the undiscounted, otherwise applicable retail rate; and
- 3. Credit exports at the undiscounted, otherwise applicable retail rate for apartment buildings in low- and moderate-income census tracts.

CALSSA notes, for clarity, that installations for each of these customer groups would count toward the step transition thresholds described in Section II.B above.

First, maintaining NEM-2 tariff eligibility for single-family residential customers with income below 80% of Area Median Income will strengthen the inroads the industry has made in

¹⁵ NEM 2.0 Lookback Study, p. 10.

recent years in serving these customers.¹⁶ Specifically, eligible customers will receive NEM credits at full retail rates minus non-bypassable charges, equivalent to the structure under the NEM-2 tariff.

Second, customers on CARE and FERA rates will receive NEM credits for exports according to the non-CARE rates of their otherwise applicable rate schedule. CALSSA disagrees with the overly simplistic conclusions suggesting that CARE and FERA customers have been left out of NEM altogether.¹⁷ NEM adoption rates for CARE customers are 4%-8% of customers, depending on the utility, while general market adoption rates near 11%.¹⁸ Given the higher proportion of CARE customers that are renters, the fact that NEM credits have been lower value for customers on CARE rates, and the Commission's prior rejection of "CleanCARE" and similar programs,¹⁹ a difference in participation rates is not surprising. The fact that 4%-8% of CARE customers have adopted solar despite the policy obstacles is impressive.

However, CALSSA strongly agrees improvements can be made to increase access to NEM for CARE and FERA customers. The issue is not new, and CALSSA's Proposal is similar

¹⁶ See NEM 2.0 Lookback Study, p. 34 (stating: "ZIP codes with lower median incomes have seen an increase in the proportion of solar PV installations in somewhat recent years as shown in Figure 3-8... . This study found that solar adoption has been gradually migrating toward lower income ranges over time, reflecting both a broadening and a deepening of U.S. solar markets.").

¹⁷ See, e.g., Utility Costs and Affordability of the Grid of the Future, pp. 28-29, California Public Utilities Commission (February 2021), available at

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid_%20Grid_%20of%20the%20Future.pdf.

¹⁸ Utility Costs and Affordability of the Grid of the Future, pp. 28-29, California Public Utilities Commission (February 2021), available at

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid %20of%20the%20Future.pdf (providing CARE adoption rates); California Distributed Generation Statistics, available at www.californiadgstats.ca.gov (providing general market adoption rates).

¹⁹ See R.14-07-002, Proposal for Alternative for Growth in Disadvantaged Communities of the Interstate Renewable Energy Council, Inc., p. 3 (August 3, 2015) ("CleanCARE would allow customers eligible for the CARE program to choose to redirect the funds associated with their CARE rate discounts toward purchasing renewable generation from a third-party developer, selected by the utility through a competitive bid process. CARE customers electing the CleanCARE option would move to the standard rate for their rate class and, through participation in the CleanCARE program, would offset a portion of their monthly bills through kilowatt-hour (kWh) bill credits. As a result, a CleanCARE customer would receive the equivalent or a lower bill than the customer would have seen under the standard CARE program rates. In this way, the CleanCARE option would increase opportunities for low-income households to participate in renewable energy programs while guaranteeing at least the bill discount available under the current CARE program.").

to proposals like CleanCARE that have been made, but were not adopted, over the past decade to address this issue, *i.e.*, creating an optional tariff for CARE and FERA NEM customers that credits exports at the same retail rate under which those customers would have otherwise taken service.

Third, one of the biggest reasons there has been less solar adoption in low-income communities is that many low-income families live in apartment buildings, and solar on apartment buildings has been harder to develop than solar on single-family homes. As noted in the Lookback Study, the trends "indicate that home ownership is more influential on NEM adoption than home property value."²⁰ The "split incentive" obstacle has hindered solar growth for renters: tenants may have an incentive to install solar, but the decisionmaker at a rental property is the property owner, who often has an incentive to minimize spending that does not directly reduce their own costs.

The Commission can make valuable progress on this challenge by approving a continuation of the current VNEM credit value for multifamily rental properties in low- and moderate-income census tracts while making practical improvements to the tariff. Such residential customers would receive the export compensation structure described above for the low-income tariff for single-family homes. The Commission can implement this by combining this tariff with the existing tariffs for customers in the Solar on Multifamily Affordable Housing program and the Multifamily Affordable Solar Housing program. Those tariffs should be harmonized with CALSSA's Proposal, and eligibility should be expanded to all apartment buildings in census tracts with average income that is at or below 120% of Area Median Income, a standard definition of moderate income. The utilities can publish a list of qualifying census tracts each year based on the American Community Survey, a product of the U.S. Census Bureau that is commonly used in program implementation.

E. Proposal for Further Improvements to VNEM

Three other key improvements to VNEM should accompany changes to improve the program overall. First, it is common for property owners to take over customer accounts when installing VNEM systems and to incorporate utility costs into rent. Currently, this results in CARE accounts losing their CARE status, causing property owners to charge customers discounted rates while the property owner is not actually getting a discount from the utility. This

²⁰ NEM 2.0 Lookback Study, p. 35.

loss of CARE status discourages solar adoption for low-income customers and is not necessary. An account should be eligible for CARE rates if the tenant meets CARE eligibility requirements even if they do not own the unit. If a property manager presents documentation that a tenant resides in a particular unit and is eligible for CARE, the utility should put that account on CARE rates even if the account is in the name of the property owner.

Second, when a new tenant moves into a unit that previously received VNEM credits, the default should be that the new tenant receives the same VNEM credits as the previous tenant. Currently, when a tenant moves out, the credits start going to a backup account. The property owner has to add the new tenant during the next annual allocation update or pay a fee to do it outside of the annual update. Instead, new tenants should automatically get the same benefit as the previous tenant in the same unit.

Finally, the Commission should allow multiple solar arrays on one property to be treated as one generator, with credits allocated across the property. The NEM-2 VNEM tariff allows multiple solar arrays on one property, but each array can only serve a subset of customers on the property. Most apartment complexes have multiple buildings that require the use of separate roof surfaces and points of interconnection. It is inefficient to treat each array separately with its own subgroup of customer accounts. The tariff should allow the output of multiple solar arrays on one property to be combined into one generation total with a portion of that total assigned to participating customers.

F. Implementation of CALSSA's Tariff Proposals

Implementation of CALSSA's proposals can be achieved entirely through an advice letter process. While the Tier 2 process may be sufficient for some components of CALSSA's proposal, such as the consumer experience provisions discussed below, Tier 3 advice letters will be necessary to implement any new tariffs under the terms of General Order 96-B.²¹ CALSSA anticipates there will not be a need for further rulings or comments on the record in this proceeding. CALSSA does not recommend or foresee the need for any working groups.

As such, CALSSA anticipates many parts of its Proposal can be implemented in mid-2022, depending on the timing of the Commission's final decision in this proceeding, the deadline set for the utilities to file implementation advice letters, the speed with which Energy

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See General Order No. 96-B, General Rules § 7.6.1 and Energy Industry Rules §§ 5.3.1-4.

Division can issue a draft resolution, and the length of the Commission's deliberation on the draft resolution. CALSSA's proposed timeline is set forth below:

Event	Timing
Commission Decision	November 18, 2021 ²²
Utilities File Implementing Advice Letters	January 18, 2022
	(Assuming decision includes 60-day deadline)
Protests and Responses Due	February 7, 2022
Draft Resolution Issued	April 2022
Comments on Draft Resolution Submitted	May 2022
Final Resolution Issued	June 2022
Tariff Effective Date	July 1, 2022

III. CONSUMER EXPERIENCE PROPOSALS

A. Monthly Billing and Reducing Unexpected End-of-Year Bills

Currently, most residential NEM customers pay energy charges once per year at the end of the annual true-up period. They pay a minimum bill each month. At the end of the year if they owe more than the cumulative minimum bill payments, they must pay that amount all at once. For customers with solar systems that offset much less than their total annual electricity usage, this can result in a very large bill that is sometimes unexpected.

There is a clear advantage to that payment system in that customers will not pay more than they owe in a year. Customers with true-up cycles that begin in the fall or winter, when solar is producing far less than its full capacity, will pay higher bills in the initial months of their annual cycle. In the summer, NEM credits may make up for the shortfall but these customers will already have sent money to the utility. Customers have the option to pay the amount they owe each month, but it is CALSSA's understanding that few do.

CALSSA now believes the advantage of paying at true-up is outweighed by the disadvantage of the potential surprise of a large bill for customers that do not expect it. For this reason, CALSSA recommends that all customers pay what they owe each month. To avoid the conditions in which customers have an amount they owe in the early months of the true-up cycle

²² See Scoping Ruling, p. 4 (November 18, 2021 is the first Commission voting meeting after November 16, 2021, which is 120 days after July 19, 2021).

that is refunded at the end of each year or carried forward each year, CALSSA recommends that all true-up cycles for NEM-3 customers begin in the April billing month.

Under this proposal, customers installing solar in any month other than April will have a partial year in their first true-up cycle. This may result in an amount owed in the partial year that is higher than the amount these customers will owe in future years, and these customers would never recover that amount. However, it will be easy to explain to customers that the first cycle is a partial year and the following cycles can be expected to perform in alignment with projections of annual savings. Because customers' relationships with their solar provider may be stronger right after installation than they may be later, this proposal also keeps this minor, but potentially confusing, aspect of NEM in the period near installation.

B. Data Access and Improving the Quality of Savings Estimates

In order to provide accurate savings estimates to customers, it is essential that DER providers have access to customer electricity consumption data for all billing intervals in a year (interval data). D.20-08-001 requires that all proposals for solar installations include savings estimates that use interval data.²³ However, that data can be difficult to obtain.

There are four ways to access customer usage data, with the drawbacks for each discussed below:

1. Register with the utility and build an automatic programming interface with the Green Button system. Approved vendors can then directly download data for customers who have given permission to do so. This approach works well for companies that are large and sophisticated enough to build and manage an automatic programming interface, but building an interface to tie in directly to utility data systems is more than should be expected of solar contractors. This function is designed for demand response providers that need ongoing access to customer data, not solar providers that only need one data download.

2. Ask the customer to log onto their utility account, download the Green Button data, save it, and e-mail it to the contractor. This approach works well for customers that are computer savvy, but there are many customers who cannot do this.

3. Obtain a written authorization from the customer, request the data from the utility by email, and wait up to four weeks for the data. This approach is not reasonable customer service.

4. Subscribe to a third-party service that has an automatic programming interface. This approach unnecessarily increases costs to customers.

²³ D.20-08-001, pp. 19-21.

CALSSA suggests an approach that will work for all customers and all companies, in all situations. Requiring the utilities to construct a portal to enable approved solar providers to upload a customer authorization form and download a file with customer interval data will seamlessly ensure timely access to customer usage data. Such access will reduce reliance on estimates that can be inaccurate and allow for timely customer service and better projections of savings data to be communicated to customers.

IV. CONSISTENCY WITH STATUTORY CRITERIA

This Proposal maintains sustainable growth of solar, includes specific alternatives for disadvantaged communities, and ensures the costs of the NEM-3 tariff are approximately equal to the benefits.

A. Sustainable Growth

Public Utilities Code Section 2827.1(b)(1) requires that NEM ensure that "customer-sited renewable distributed generation continues to grow sustainably."²⁴

Over the last five years, California has seen a material erosion in the value of solar to customers. Between 2016 to 2021, the value a residential customer receives for a rooftop solar system has been almost cut in half. This is the result of the combination of (1) requiring time-of-use rates, (2) the introduction of non-bypassable charges in the NEM 2.0 structure, and (3) the reduction in the federal solar ITC. For example, analyzing an SCE customer purchasing a 6 kW system with a 20-year loan and 3.99% APR results in an effective 50% reduction in the NEM export rate value over this five-year period.

²⁴ Cal. Pub. Util. Code § 2827.1(b)(1).



Figure 3. Estimated 20-Year Solar Savings for Residential SCE Customer

Clearly, California has no control over federal policies like the ITC, but changes to California's NEM structure have eroded the long-term value proposition of behind-the-meter solar investment. As a result, growth in DER installations have leveled off under NEM-2. Evening peaking time-of-use has had devastating impacts on the commercial market. NEM-2 changes as a whole have kept the residential market from growing year over year.



Figure 4. Residential Solar Interconnections²⁵

Further changes to NEM threaten to replace the flat growth we have seen in the residential solar market with negative market growth in the future, if the value proposition of solar is reduced too dramatically and/or too quickly.

The Distributed Generation Market Demand Model ("dGen") from NREL models market demand for distributed solar under different policy assumptions.²⁶ Initial results of California data for the three IOUs suggest that changes to NEM could eviscerate the market for customersited solar in the residential segment. The model predicts that the California solar market will decline sharply even in the best-case scenario, and that major changes to NEM would devastate the market altogether with a drop of 65% if export values were suddenly set to Avoided Cost Calculator rates.

dGen is a highly granular market diffusion model representing almost 2000 representative residential classes of customers within California across geography, utility territory, and load size. The tool analyzes how many customers have electricity usage patterns,

²⁵ California Distributed Generation Statistics, *available at* <u>www.californiadgstats.ca.gov</u>. The annual totals are based on the totals reported in each month. Data for 2020 includes a projection for December because December 2020 data has not yet been released. In some cases the annual totals are slightly higher than the values currently reported because customers that make material changes to their systems get moved to a new interconnection date.

²⁶ See Distributed Generation Market Demand Model, NREL, <u>https://www.nrel.gov/analysis/dgen</u>.

tariffs, and spatial availability that are favorable to solar adoption. It assumes the best customers adopted first and future customers will be more challenging. CALSSA believes this assumption is overly conservative and that market saturation is not an impact that will be experienced in the near future. CALSSA believes the solar industry can maintain current market activity throughout this decade. However, dGen is still useful for comparing different scenarios against each other. Figure 5 below shows that moving immediately to a vastly different NEM tariff structure would eliminate the majority of market activity. In addition to demonstrating the risk of moving too quickly on changes to NEM, indications of a potential downturn in single-family residential installations add urgency to developing the multifamily market and reducing the costs of installing energy storage.



Figure 5. Single-Family Residential Results From the NREL Distributed Generation Market Demand Model

In light of this current climate and predictive modeling, it is essential to create a glidepath to transition from the NEM-2 export credit to the final percentage credit levels. The Legislature recognized the need to avoid the fits and starts that can result from changing policy by requiring

that the successor tariff ensure sustainable growth of distributed solar. The army of local contractors skilled in solar design and installation is a valuable asset in the long road to meeting the state's greenhouse gas reduction imperative. Rate shock would drive many of those contractors out of business and harm the State's long-term objectives.

The step-down structure highlighted in Section II above would lead to the expected payback periods shown in Table 6. There is strong consensus among solar contractors that an average payback period of seven years is needed to maintain the current level of market activity. The levels in Table 6 assume that each step transition happens two years apart. Customers in Step 1 will be eligible for the federal ITC at 26% in 2022 and 22% in 2023. Customers in later steps will not receive the ITC according to the current schedule.

	PG&E		SCE		SDG&E	
	Solar	Solar + Storage	Solar	Solar + Storage	Solar	Solar + Storage
Step 1	7.1	11.1	6.4	10.5	6.1	8.0
Step 2	9.3	13.0	8.0	12.3	7.9	9.4
Step 3	8.7	10.8	7.2	10.1	7.3	8.0
Step 4	8.1	9.5	6.5	8.7	6.9	7.1
Step 5	7.7	7.2	5.9	7.5	6.8	6.4

Table 6. Payback Periods Under CALSSA's NEM-3 Proposal

B. Disadvantaged Communities

Public Utilities Code Section 2827.1 also requires the inclusion of specific alternatives designed for growth among customers in disadvantaged communities.²⁷ CALSSA's proposals directly benefit these communities by addressing CARE customers and the "split incentive" obstacle that has hindered solar growth for renters. As shown in the first line of the table below, which was included in the CEC's 2018 IEPR docket, the socioeconomic factor indicators for CalEnviroScreen-defined disadvantaged communities demonstrate that there is a strong overlap with low-income households and renters.²⁸

²⁷ Cal. Pub. Util. Code § 2827.1(b)(1).

²⁸ California Energy Commission, *Energy Equity Indicators Tracking Progress*, Docket No. 18-IEPR-08, pp. 8-10 (June 18, 2018).

	PG&E	SCE	SCG	SDG&E
Percent of ESA Low-Income				
Customers That Are Renters ¹	56%	45%	46%	70%
Percent of ESA Low-Income				
Customers in Multifamily				
Households ¹	22%	21%	22%	48%
Percent of Total Customers on				
CARE ²	26%	30%	29%	20%
Number of Customers on CARE ²	1.4 M	1.3 M	1.6 M	0.3 M
Total Annual CARE Subsidy				
Amounts	\$558.6 M	\$372.6 M	\$102.3 M	\$76.4 M
Average Annual CARE Subsidy				
per Customer ²	\$392	\$291	\$66	\$282

Table 7. California 2015 Investor-Owned Utility Low-Income Customer Statistics

¹Numbers based on ESA Program participants, which may not represent the entire low -income population of each IOU territory. The ESA Program Multifamily Segment Study Report (The Cadmus Group, Inc., 2013) contains additional information on low income IOU customers in multifamily housing.

²CARE enrollment and number of active accounts vary slightly frommonth to month. These numbers are based on December. Source: California Public Utilities Commission ESA/CARE information

CALSSA also includes a proposal to increase adoption of DERs by CARE and FERA customers as well as by single-family residential customers with income below 80% of Area Median Income.

This Proposal does not include, and CALSSA strongly disagrees with, regressive "feebate" proposals that would charge existing NEM customers in order to fund programs for customers in disadvantaged communities. Such proposals rely on overly simplistic assumptions of the amount of fees existing NEM customers—many of whom are located in disadvantaged communities or earn low-to-medium incomes—can absorb without undermining their existing payback periods. The result is a substantial consumer protection concern that is almost certain to harm the same populations it is intended to help.

Feebate proposals that apply to NEM 1.0 customers would also violate Section 2827(g) of the Public Utilities Code, which requires "each net energy metering contract or tariff" to "be identical, with respect to rate structure, all retail rate components, and any monthly charges, to the contract or tariff to which the same customer would be assigned if the customer did not use a renewable electrical generation facility."²⁹ A solar-specific charge for these customers violates this safe harbor provision.

California needs more clean generation. The Commission should not establish a new tax on clean generation. CALSSA agrees that California needs a major initiative that incorporates funding for all DERs, including EVs, heat pumps, low-income solar, and energy storage;

²⁹ Cal. Pub. Util. Code § 2827(g).

however, the appropriate body to push such an initiative is the Legislature. The initiative should be funded by the tax structure, which is progressive, and not the rate structure, which is regressive. A feebate is akin to taxing beneficial technologies like EVs. The State needs more EVs, so it does not tax them. By the same token, the State requires more local clean generation in order to meet its greenhouse gas reduction goals, so it should not tax solar.

C. Cost-Benefit

1. CALSSA's Proposal is Cost-Effective.

Public Utilities Code Section 2827.1(b)(4) requires that the Commission "[e]nsure that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs."³⁰

Under any NEM-3 proposal, the TRC will change over time with a changing customer cost of solar and increasing avoided costs. In 2022-2023, when the federal ITC for solar energy and solar plus storage is at 26% and 22% respectively, the TRC is well above zero. In 2024, the ITC for residential customers is scheduled to be eliminated. That year will likely be the most challenging for solar programs to pass the TRC. As shown in Table 8, the 2024 TRC for NEM exports is very close to 1.0 for PG&E and SDG&E and is well above 1.0 for SCE.

The RIM will change over time as utility avoided costs and the value of NEM credits change. Table 8 presents 25-year levelized RIM results with a 2022 start year.

	PG&E		S	CE	SDG&E	
	Solar	Solar + Storage	Solar	Solar + Storage	Solar	Solar + Storage
2024 TRC	0.98	0.90	1.19	1.17	1.02	1.04
RIM	0.94	0.96	0.95	1.04	0.92	0.92

Table 8. Cost-Benefit Results

Key elements are missing from the TRC and RIM tests. As explained in Section VI below, DERs provide benefits for land conservation, avoidance of uncalculated future transmission needs, and community resilience. These are concrete impacts but are difficult to

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Cal. Pub. Util. Code § 2827.1(b)(4).

measure. Because of these factors, the Commission should consider any RIM score above 0.9 to be cost-effective.

2. Additional Benefits from CALSSA's Proposal

While CALSSA's proposal meets the statutory standard, key elements are missing from the TRC and RIM tests. DERs provide benefits for land conservation, avoidance of uncalculated future transmission needs, and community resilience. These are concrete impacts but are difficult to measure. Because of these factors, the Commission should consider any RIM score above 0.9 to be cost-effective. CALSSA also discusses herein the important, but difficult to measure, need for allowing the distributed energy storage market to mature.

a. Energy Storage

A primary objective of DER policy is to transition the primary product offering in the marketplace from standalone solar to solar plus storage. That transition has begun, thanks mostly to the Self Generation Incentive Program. Continued growth can be expected, but the rate of change is highly uncertain. NEM policy should be designed to ensure that the overall market for DERs remains strong while energy storage has time to reach maturity.

Approximately ten percent of residential solar systems now include storage. In the second half of 2020, 11% of residential solar applications included storage for PG&E, 8% for SCE, and 9% for SDG&E.



Figure 6. Percentage of Residential Solar Applications that Include Storage³¹

³¹ PG&E, SCE, and SDG&E Responses to CALSSA Data Request to Joint IOUs 2, Question 3.

There are multiple obstacles to the continued increase in customer-sited energy storage. First is battery availability. There is tremendous worldwide demand for battery cells. Production is increasing, but this will translate slowly to energy storage product supply specific to energy storage for homes and small businesses in California. Small installers often cannot obtain hardware. To the extent storage becomes necessary for DER viability, the large national solar providers will likely lock up supply contracts and make storage even more out of reach for small contractors.

Second, utilities and local governments are extremely conservative in reviewing proposed installations for grid safety and compliance with building code, electrical code, and fire code. National codes and standards are evolving to ensure safety and reliability with minimal site-specific review. Questions on where batteries can be installed with and without fire suppression measures are not settled. Until those codes and standards are widely deployed and understood site-specific review will add major costs to projects. Municipal permitting and utility interconnection processes simply take longer (adding cost) with solar plus storage in California than solar only.

Third, contractor expertise will take time to develop. The most important element of a contractor's work is code compliance. They must do quality work that meets all safety standards. They cannot jump into offering a product without thoroughly understanding how it works and how to do it right. With variations in the electrical characteristics and energy management approaches between storage devices, contractors must proceed cautiously. For these reasons and more, the Commission should allow time for the DER market to remain strong while energy storage steadily gains market share.

b. Land Use

Modeling for implementation of SB 100 indicates a need to nearly triple the amount of utility-scale solar built every year through 2045. This will be an enormous challenge and will put pressure on land availability and transmission capacity. Those challenges have not even been studied. CALSSA does not believe the existing estimates for the cost of future utility-scale solar are realistic. Projections assume the installation of approximately 1 GW of distributed solar each year through at least 2030. If less distributed clean energy is built, even more utility-scale renewables will be needed.

The draft SB 100 report, jointly produced by the Commission, the California Energy Commission, and the California Air Resources Board, states, "Over the last decade, California has built on average 1 GW of utility scale solar and 300 MW of wind per year, with a maximum annual build of 2.7 GW of utility scale solar and 1 GW of wind capacity. As shown in [the figure below], the SB 100 Core Scenario requires 25-year average build rates consistent with or greater than the single year historical build rates."³²

Figure 7: Average Resource Build Rates for Solar, Wind and Batteries in the SB 100 Core High Electrification Scenario



This would require development of more than one million acres of land.³³ For context, all California land development over all time totals 6 million acres.³⁴ Finding that much available land for renewables development will be enormously difficult, especially given the constraint of siting projects near existing transmission corridors or in locations where new transmission can be sited.

The answer to land use constraints for utility-scale solar is not more industrial wind, as wind can have even greater land use impacts. As noted in a recent research collaboration that included E3, "compared to solar, wind is more limited in the more protective scenarios because of the relative rarity of low-conflict sites with high wind speeds. Wind resources are generally more spatially heterogeneous, while also having lower land use efficiencies when considering turbine spacing, making it more sensitive to land use restrictions."³⁵

That research paper also states, "In High DER scenarios, 12%-14% of California's 2050 demand can be met with rooftop solar. These scenarios *still require* 100-145 GW of utility-scale

³² CEC, CPUC, CARB, "Draft 2021 SB 100 Joint Agency Report," December 2020, pp. 20-21.

³³ Defenders of Wildlife and the Nature Conservancy, "Comments on December 2020 Draft SB 100 Joint Agency Report," submitted to CEC docket 19-SB-100, December 18, 2020.

³⁴ U.S. Natural Resources Conservation Service, "2017 Natural Resources Inventory," *available at* <u>https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/nri_ca.html</u>.

³⁵ Grace C. Wu et al, "Low-impact land use pathways to deep decarbonization of electricity," *Environmental Research Letters*, July 10, 2020, p. 9.

capacity in SL3 across all Geographies, or 5,180-8,740 km2 of land, which would *double* the recent historical rate of urbanization in California."³⁶

c. Yet-To-Be Calculated Transmission Costs and Future Utility Rate-Based Investment

Similar to the land use discussion above, utility-scale renewables development will require new transmission capacity at a time when siting and paying for additional transmission appears more challenging than ever. Increased transmission needs were not studied in SB 100 modeling. This shortcoming was noted by many parties, including the following comments on the draft SB 100 report.

- SDG&E: Transmission specific resources must be identified in local areas to accurately identify the impacts. Until that modeling is performed, the transmission costs associated with the delivery of power that would be needed to support the resource mix will be understated. The Joint Agencies need to ensure that modeling of new capacity also includes necessary incremental transmission costs.³⁷
- SCE: No matter which scenarios are evaluated or which resource types are selected, the SB 100 Report's draft modeling results imply a significant need for transmission to connect and deliver these resources to load centers. Given the lead time it takes to increase the capacity of existing transmission lines or build new transmission lines, we need to start planning and executing on grid capacity growth now.³⁸
- LADWP: Along with retirements of thermal capacity (once-through cooling and economic retirements) close to the load centers, electric utilities will have an increased dependency on major transmission lines to import renewables and energy storage. As peak load continues to grow, maintaining a resilient resource mix at all times will be challenging, yet critical...LADWP recommends that RESOLVE takes into consideration detailed analysis of transmission constraints resulting from extreme weather patterns.³⁹

³⁶ *Id.* SL3 represents a siting level with medium restrictiveness.

³⁷ CEC Docket No. 19-SB-100, *SDG&E Comments on SB 100 Modeling Results Workshop Comments Final*, p. 6 (September 15, 2020).

³⁸ CEC Docket No. 19-SB-100, *Southern California Edison Company Comments – on SB 100 Draft Results Workshop*, p. 2 (September 15, 2020).

³⁹ CEC Docket No. 19-SB-100, *LADWP Comments on SB 100 Workshop*, pp. 3-4 (September 15, 2020).

[T]he amount of transmission to support these resources will be the limiting factor in terms of the timeline to achieve SB 100 milestones.⁴⁰

- NRDC: [T]he SB 100 report should provide recommendations on near term policy actions required to bring these resources online in a timely manner, such as providing the information necessary to conduct transmission planning as recommended by CAISO at the workshop.⁴¹
- CAISO: Experience with RESOLVE, in particular, shows that many important policy considerations are not readily quantifiable and therefore are either ignored or require manual workarounds to capture.⁴² New transmission projects may be necessary to interconnect large-scale in-state renewables, access offshore wind, or enable out-of-state resource development or other policy-driven considerations. However, the transmission permitting, siting and construction processes can take 10 years or more. Therefore, planning for transmission-dependent projects should start as soon as possible.⁴³

Of particular note are CAISO's comments that replacing gas-fired generation that is located close to load with renewable generation that is far from load is not an equal trade in terms of transmission needs. CAISO states:

Currently, the modeling framework is based on a system-wide analysis even though the vast majority of the gas-fired fleet on the CAISO grid is located in the local capacity areas. Based on the current trending of resource adequacy procurement, local capacity area generation closely matches the local need requirement. In other words, it is difficult to retire existing resources without falling below the local capacity need requirement. On the other hand, transmission solutions can increase the transfer capability into local areas. Although the CAISO remains supportive of considering transmission solutions, such upgrades face numerous permitting, siting, and construction challenges. In the meantime, gas-fired resources within the local capacity areas may retire for other reasons such as when they reach their physical end of life, or mature out of long-term commercial contracts.⁴⁴

⁴⁰ *Id.*, p. 7.

⁴¹ CEC Docket No. 19-SB-100, *Natural Resources Defense Council Comments – on SB 100 Draft Results Workshop (September 2020)*, PDF p. 6 (September 15, 2020).

⁴² CEC Docket No. 19-SB-100, *CAISO Comments on Modeling Inputs & Assumptions Workshop*, p. 1 (March 10, 2020).

⁴³ *Id.*, p. 8.

⁴⁴ *Id.*, p. 7.

The need to study new transmission was also highlighted by joint state agencies in response to the August 2020 blackouts. The Root Cause Analysis recommended, "Building on the Senate Bill (SB) 100 (De Leon, Chapter 312, Statutes of 2018) scenarios, consider where diverse resources can be built and the transmission and land use considerations that must be considered. Establish a transmission technical working group (CAISO, BAS, CEC, CPUC) to evaluate the transmission options and constraints from the SB 100 scenarios."⁴⁵

The Commission's recent paper on electric rates, *Utility Costs and Affordability of the Grid of the Future*, made clear that transmission spending is the biggest upward pressure on rates. The report finds that utility transmission revenue requirements and rate base increased by <u>38 percent</u> from 2016 to 2021.⁴⁶ Because transmission costs are amortized over many years, transmission spending can lock in rate increases for decades. Every reduction in the need for new transmission is a long-term cost savings. The paper states: "Conservative assumptions indicate that every dollar put into transmission rate base costs ratepayers in excess of \$3.50 over the life of a transmission asset."⁴⁷ Comments on the SB 100 draft report suggest that policy-related transmission costs will increase even further in the future. The Commission should not exacerbate that problem by failing to enable distributed solar.

Another potential outcome is that California simply fails to achieve its greenhouse gas reduction objectives. If the state relies on utility-scale renewables and allows the distributed solar and storage market to wither, and is then unable to site transmission lines, there is a high likelihood that California will abandon its commitments to addressing climate change. The decision on NEM today is, in part, a decision on our long-term climate commitments.

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid %20of%20the%20Future.pdf.

⁴⁵ CAISO, CEC, CPUC, "Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave," January 13, 2021, p. 74.

⁴⁶ Utility Costs and Affordability of the Grid of the Future, p. 36, California Public Utilities Commission (February 2021), available at

⁴⁷ Utility Costs and Affordability of the Grid of the Future, p. 37, California Public Utilities Commission (February 2021), available at

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid_%20Grid_%20of%20the%20Future.pdf.

d. Resilience

Recent wildfires and grid failures have caused a vibrant public debate about community energy resilience. The vulnerability of customers with special medical needs is a cause of great concern. The Commission has steered the majority of energy storage incentive dollars to support customer resiliency.⁴⁸ Local governments have expressed interest in microgrids. Many residential customers have purchased backup power, mostly in the form of natural gas or gasoline generators but also as battery storage, despite the challenging economics of battery storage at current prices.

Communities will benefit from backup power sources at both public and private locations. Resilience centers at schools and other public buildings may be designed to provide services to vulnerable populations. Community members will help friends and neighbors in need. The more that backup power sources proliferate in a community, the easier it will be for people to find help when they need it. Having a viable market for DERs will help communities reach a scale of resources where everybody benefits.

The Commission should also consider the environmental benefit of clean backup power in comparison with fossil fuel generators. Many customers are currently purchasing backup power in the form of gasoline or natural gas generators in the face of rampant wildfires. Sales of fossil generators have soared in recent years.⁴⁹ The California Air Resources Board relaxed air quality standards in 2019 to allow the sale of generators that had been prohibited.⁵⁰ Policies to increase the viability of customer-sited energy storage should be considered in the context that many of those systems will offset fossil fuel generators. It is entirely feasible, and desirable, for energy storage systems to be used both for backup power and grid reliability. Customers will be able to cycle batteries daily or during extreme market conditions while reserving some capacity for backup needs. Solar and storage DERs are the *only* non-fossil fuel options customers currently have to keep their lights on during Public Safety Power Shut-offs.

⁴⁸ See D.19-09-027, COL 9, COL 35.

See, e.g., "Blackouts, Disasters Give Generators a Sales Boost," *Wall Street Journal*, January 2, 2020.

⁵⁰ CARB Advisory #297: CALIFORNIA STATE OF EMERGENCY (October 27, 2019): SALE, OFFER FOR SALE, AND IMPORTATION OF U.S. EPA CERTIFIED RESIDENTIAL-TYPE GENERATORS INTO CALIFORNIA, *available at* https://ww2.arb.ca.gov/resources/documents/advisory297.

In addition, grid reliability will be boosted when energy markets and programs are updated to incorporate behind-the-meter resources effectively. Aggregating fleets of dispatchable resources into virtual power plants should be a major grid reliability strategy of the future. One of the important steps to getting there is having a large enough concentration of resources to make a difference. NEM can pave the way for resource growth that is harnessed for grid benefit when the rules and price signals become available.

The benefits of clean backup power are numerous and real, but are difficult to quantify. The Commission could manage a discussion to produce a numeric value. Factors to be considered would include:

- The cost of gasoline generators, the most common form of backup power.
- The difference between the cost of energy storage and the resulting energy bill savings.
- The air quality benefits of batteries over gasoline generators with two-stroke engines.
- Social, environmental, and health cost of gasoline generators. For example, recent extreme weather events in Puerto Rico, California, Louisiana, and Texas all resulted in the environmentally detrimental deployment of diesel generators. Fortunately these events are also beginning to highlight the more recent ability of clean solar plus storage alternatives to help customers and communities.⁵¹

⁵¹ Puerto Rico: In 2017, Hurricane Maria devastated the island of Puerto Rico, and caused an islandwide blackout that was the second largest in the world, by customer hours. Fire departments and first responders were unable to provide critical services due to this lack of power. Nonprofits and solar companies stepped in to provide solar and batteries to fire stations to get these critical services back online quickly. Even so, the New York Times reported that people turned to diesel and gas generators, which turned Puerto Rico into "Generator Island." Solar and batteries are a clean solution that should be deployed at scale.

California wildfires and PSPS: According to the California Air Resources Board online tool that allows consumers to compare solar, fuel cell and other types of generators, operating a new, average portable gasoline generator (~3.5 hp) at an average load of 1.8 kW for 1 hour emits as much smog-forming pollution as driving an average passenger vehicle for about 150 miles. Diesel particulate matter (PM) emissions from an average industrial diesel generator (~800 hp), operating at an average load of ~300 kW for 1 hour, is equivalent to driving nearly 660 miles in an average heavy duty diesel truck (about the distance from Sacramento to Salt Lake City).

Louisiana: More deaths associated with Hurricane Laura were caused by the improper use of portable generators than the storm itself.

- Economic damage caused by blackouts.
- Capacity payments in resource adequacy programs.

Rather than attempting to quantify those benefits in this proposal, CALSSA proposes that the Commission accept that there is an economic benefit to all customers of resilience, uncalculated transmission avoidance, and land conservation, and in response to tolerate RIM results for NEM that are less than 1.0.

3. Impacts of Electrification and Future Fixed Charges Bolster the Cost-Effectiveness of CALSSA's Proposal.

Two factors are not currently included in CALSSA's cost-benefit analysis but would further bolster its results: (1) the impacts of electrification on "lost" utility revenues from DER energy production; and (2) the likelihood of future fixed charges being implemented on all residential customers.

a. CALSSA's Proposals Will Not Result in Reduced Sales if the Commission's Own Base Case for Electrification Holds True.

Californians are not obligated to purchase electricity from the State's utilities beyond their minimum bills, and it has long been California policy to encourage customers to reduce energy consumption and conserve resources. Strong energy efficiency policies and, more recently, policies like NEM to encourage the installation of onsite DERs to lower electricity demand have been some of the State's great successes in keeping overall electricity demand relatively stable while its population increases. Despite this long-term commitment to reducing load, the Commission expressed concerns during its February 24, 2021 *en banc* that a "kWh sales decline" could cause upward pressure on rates through the year 2030.⁵²

However, the Commission's own assumptions for electrification show the concern over lost utility sales over the next decade is overstated, if not vastly so. The Commission's paper, *Utility Costs and Affordability of the Grid of the Future*, shows the large increase in demand that will result from the State's transportation and building electrification efforts. The Commission's reference scenario reflects sales assumptions from the 2019 IEPR Mid Demand case, which assumes "4 million EVs and plug-in hybrids on the road by 2030 (statewide) with negligible

⁵² California Public Utilities Commission, *Utility Costs and Affordability of the Grid of the Future*, Slide 12 (February 24, 2021).

electric medium- and heavy-duty vehicles and negligible building electrification."⁵³ That *reference* scenario suggests there will be 15 TWh of CAISO-wide vehicle and building electrification load in 2030, with the High Electrification scenario adding another 18 TWh of electrification load by 2030 for a total of 33 TWh.⁵⁴

The CALSSA Proposal in this case is aimed at maintaining the average pace from recent years of installing approximately 1,200 MW of solar and storage-paired DERs each year. Twelve hundred MW of solar produces approximately 1.9 TWh of electricity per year. If the State installs 1,200 MW per year from the beginning of next year through the end of 2030, utility load would be reduced by approximately 17 TWh. That is, CALSSA's Proposal would, at most, slightly more than offset the increase in load the Commission assumes in its reference case will result from electrification and only half of the load in the High Electrification scenario. Putting aside the fact that Californians are not obligated to purchase any electricity from the State's utilities other than their minimum bills, CALSSA's Proposal would not lead to lost sales for those utilities if the Commission's own assumptions on electrification come to fruition. Further, it will be advantageous to match new electricity consumption with new generation so that increased spending on distribution infrastructure is minimized.

b. Fixed Charges May Be Imposed on All Residential Customers in Future Rate Cases.

CALSSA's NEM-3 Proposal does not include a monthly fixed charge or a requirement to be on a rate that includes a fixed charge. E3 in its white paper takes the position that the majority of utility costs are fixed, and we fundamentally disagree. There is a benefit to the utilities of having some amount of guaranteed monthly revenue, but we anticipate a major step in that direction soon with Commission approval of a fixed charge for all residential customers. In the default TOU proceeding,⁵⁵ the IOUs proposed fixed charges ranging from \$6.37-\$10. D.20-

⁵³ Utility Costs and Affordability of the Grid of the Future, p. 84, California Public Utilities Commission (February 2021), available at

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid

Id.

⁵⁴

⁵⁵ A.17-12-011, consolidated with A.17-12-012 and A.17-12-013.

03-003 rejects the IOUs' proposals for fixed charges because the proposals lacked sufficient marketing, education, and outreach.⁵⁶

D.20-03-003 states: "The ME&O plans provided by the IOUs in this phase of the proceeding lack detail and do not ensure that the fixed charge proposals of the IOUs will satisfy rate design principle 10."⁵⁷ That principle provides: "Transitions to new rate structures should emphasize customer education and outreach that enhances customer understanding and acceptance of new rates, and minimizes and appropriately considers the bill impacts associated with such transitions."⁵⁸ However, the decision "does not prejudice any future applications for default residential fixed charges. The IOUs may, if they wish, file individual applications or a joint application in the future that proposes default fixed charges for residential customers."⁵⁹

It is CALSSA's expectation that the utilities will soon file applications with residential fixed charges that include customer outreach plans sufficient to satisfy the Commission's rate design principles. Solar customers would be included in such a fixed charge. Solar customers do not constitute a separate rate class. A fixed charge should be an element of rate design rather than a fee added outside of rate design.

V. CONSISTENCY WITH GUIDING PRINCIPLES

D.21-02-007 establishes eight guiding principles to which parties' proposals should adhere.⁶⁰ CALSSA's Proposal is consistent with each of these guiding principles.⁶¹

A. Statutory Requirements

Guiding principle (a) provides that "[a] successor to the net energy metering tariff should comply with the statutory requirements of Public Utilities Code Section 2827.1."⁶² As discussed in detail in Section IV herein, this Proposal complies with each of the relevant statutory mandates within Public Utilities Code Section 2827.1.

⁵⁶ D.20-03-003, p. 21, FOF 1, COL 1.

⁵⁷ *Id.*, FOF 5.

⁵⁸ *Id.*, p. 9.

⁵⁹ *Id.*, p. 21.

⁶⁰ D.21-02-007, OP 1.

⁶¹ Id.

⁶² *Id.*, OP 1(a).

B. Equity

Guiding principle (b) provides that "[a] successor to the net energy metering tariff should ensure equity among customers."⁶³ CALSSA's Proposal will ensure equity among customers by both offering targeted policies to accelerate DER adoption among low- and middle-income customers and achieving cost-effectiveness goals.

First, as described in Section II.D above, CALSSA's targeted policy proposals for residential customers with income below 80% of Area Median Income, customers on CARE and FERA rates, and customers residing in multifamily rental properties in low- and moderateincome locations are designed to increase access to DERs for low- and middle-income customers. Accelerating adoption among these customer groups is vital to both the state's clean energy goals and to ensuring that the successor tariff structure equitably serves all California residents.

Second, as described in Section II.B above, CALSSA's proposed step down of the export credit value for NEM for general market residential customers is designed to achieve cost-effectiveness of NEM exports from the perspective of both the TRC and the RIM test, which measures impacts to nonparticipating customers.⁶⁴ The step-down structure increasingly improves the successor tariff's performance on RIM. Most importantly, however, the Proposal also achieves strong cost-effectiveness outcomes according to the TRC, the test mandated as the primary cost-effectiveness test in this proceeding.⁶⁵

In addition, CALSSA's proposal does not include a fixed monthly solar-only charge, which would disproportionally impact access to solar for low- and medium-income households.

C. Consumer Protection

Guiding principle (c) provides that "[a] successor to the net energy metering tariff should enhance consumer protection measures for customer-generators providing net energy metering services." ⁶⁶ In Section III above, CALSSA details proposed reforms regarding monthly billing and data access that will greatly improve customer experience with the NEM tariff and reduce

⁶³ *Id.*, OP 1(b).

⁶⁴ See California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects, p. 13, California Public Utilities Commission (October 2001), available at https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy

⁻ Electricity and Natural Gas/CPUC_STANDARD_PRACTICE_MANUAL.pdf.

⁶⁵ D.21-02-007, pp. 35-36 and FOF 4.

⁶⁶ *Id.*, OP 1(c).

the risk of regulatory uncertainty for these customers. These two measures, taken together, will significantly enhance consumer protection for NEM participants.

Moreover, CALSSA's proposal provides an eligibility period of 20 years, meaning any customer that installs solar during a particular step will maintain that step for 20 years. CALSSA also strongly supports the Commission's existing precedent protecting NEM 1.0 and 2.0 customers from changes to their tariffs that would undermine existing export compensation mechanisms for 20 years.⁶⁷ Modifying these protections for existing NEM customers, or preventing similar protections for future NEM-3 customers, would severely undermine customers' investment certainty and the ability to provide customers with accurate solar savings estimates.

D. Technology Neutrality

Guiding principle (d) provides "[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."⁶⁸ All eligible technologies can participate in CALSSA's proposed tariff.⁶⁹ CALSSA would additionally support the availability of export compensation based on the time-of-use period averaging of Avoided Cost Calculator values, as shown in Table 3, which would move further in the direction of technology neutrality.

E. Coordination with Commission and California Energy Policies

Guiding principle (e) provides "[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."⁷⁰

CALSSA's Proposal is consistent with these state energy policies. As noted in the introduction hereto, the State will not be able to achieve its ambitious greenhouse gas goals without a strong solar industry with the ability to facilitate the transition to widespread customersited energy storage. In the context of the level of interplay between these two industries, and because meeting the State's greenhouse gas reduction goals through utility-scale renewables

⁶⁷ D.14-03-041, p. 2; D.16-01-044, pp. 100-101.

⁶⁸ D.21-02-007, OP 1(d).

⁶⁹ See Cal. Pub. Util. Code § 2827.1(a).

⁷⁰ D.21-02-007, OP 1(e).

alone is not feasible, CALSSA's Proposal prioritizes a step-down structure that will avoid major market disruption.

In addition, the CEC's Building Energy Efficiency Standards require solar on all new home construction.⁷¹ Drastic modifications to the NEM tariff, or the rates NEM customers must pay, may undermine the CEC's ability to achieve its goals, specifically the requirement that there be cost savings over the course of a 30-year mortgage.⁷² CALSSA's Proposal maintains payback periods that ensure the installation of solar on all new homes makes economic sense for the customers living in those homes.

F. Transparency

Guiding principle (f) provides "[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."⁷³ CALSSA's Proposal includes various elements to help ensure transparency and terms that will be understandable to customers:

- None of the reforms in this Proposal interfere with behind-the-meter consumption rights, and therefore the Proposal does not disturb customers' current expectation and understanding that their behind-the-meter consumption is off-limits for utility interference and regulation.
- The proposed NEM successor tariff for general market residential customers will step down the export rate in predictable steps, and potential customers will have adequate notice of the timeline for these step downs.
- To ensure transparency and avoid confusion, the Proposal requires the utilities to track progress toward each step-down threshold and file a Tier 1 advice letter before the threshold is projected to be hit that establishes a firm date—at least three months after the advice letter is filed—for the transition to take place.

See Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2019 Update to the Title 24 Part 6 Building Energy Efficiency Standards, Rooftop Solar PV System, pp. 39-40 and 44-46, Energy and Environmental Economics, Inc. (September 2017), available at https://ww2.energy.ca.gov/title24/2019standards/rulemaking/documents/code-proposal-reports/index.php.

⁷¹ Efficiency Standards California Code of Regulations, Title 24, Part 6 § 150.1(c)14 (*available at* <u>https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf</u>).

⁷³ D.21-02-007, OP 1(f).

- The Proposal does not include additional elements such as the market transition credit proposed by E3, which would add an unnecessary layer of complexity and ratepayer risk to the NEM tariff.
- The Proposal's low-income and rental customer policies are straightforward and clear. Rather than relying on complex rate structures or reforms, these proposals simply maintain the current NEM-2 structure for certain low-income and renter customers, and allow CARE and FERA customers to receive NEM credits at the same level as the nondiscounted rates of their otherwise applicable rate schedule.
- The Proposal with respect to commercial customers could not be more straightforward: CALSSA proposes no reform for commercial customers.
- CALSSA's two consumer experience-related provisions are both aimed at eliminating unexpected outcomes for customers on the NEM tariff.

G. Maximize Value

Guiding principle (g) provides "[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."⁷⁴ Measures of CALSSA's NEM-3 successor tariff's cost-effectiveness—as shown in its TRC scores—demonstrate the substantial value this tariff will deliver to all customers and the electrical system. In addition, the Proposal encourages customers to install energy storage by having a milder step-down schedule for solar plus storage. Energy storage will maximize the value of customer-sited renewable generation.

H. Competitive Neutrality

Guiding principle (h) provides "[a] successor to the net energy metering tariff should consider competitive neutrality amongst Load Serving Entities."⁷⁵ CALSSA's Proposal adheres to this guiding principle in that nothing in this Proposal favors or would provide competitive advantage to certain LSEs over others.

⁷⁴ *Id.*, OP 1(g).

⁷⁵ *Id.*, OP 1(h).

VI. NEM POLICY CHANGES HAVE HAD IMMENSE IMPACTS IN OTHER STATES AND IN CALIFORNIA.

A. E3's White Paper Hides the Actual Impacts of Changes to NEM in Other States.

The E3 white paper presented solar adoption data from utilities that made changes to NEM in other states.⁷⁶ There is one chart with cumulative solar growth for each utility,⁷⁷ but that chart hides the market disruption that occurred. The monthly installation numbers during the periods when policy changes occurred tell an entirely different story. In light of these figures, CALSSA cautions against the abrupt changes for which the utilities and other parties in this proceeding have already advocated.

1. NV Energy

On February 12, 2016, the PUCN adopted far-reaching changes to DER rates and compensation regimes, stemming from a December 23, 2015 order to do so. The new rate regime was initially applied to all existing and new NEM customers over a 12-year phase-in period. Ultimately, the transition process would have resulted in the fixed customer charge rising to \$38.51 by 2028 with the credit for excess generation reduced to roughly 26% of the projected retail rate for Nevada Power Company residential DER customers.⁷⁸ The public backlash was swift and significant and, in a subsequent September 2016 decision, the PUCN allowed for legacy treatment for customers with pending NEM applications as of December 31, 2015, permitting them to opt-in to legacy NEM by the end of February 2017.⁷⁹ This deadline was later extended to July 1, 2017 in an April 2017 decision.⁸⁰

In response to widespread public dissatisfaction with the State's distributed solar and energy policies, the Legislature then passed, and the Governor signed, A.B. 405 in June 2017.

PUCN. Docket Nos. 16-07028 and 15-07029. Order dated September 16, 2016, available at
 <u>http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2016-7/15119.pdf.</u>
 PUCN. Docket No. 17-03028. Order dated April 7, 2017, available at

⁷⁶ E3 White Paper, pp. 34-38.

⁷⁷ *Id.*, p. 38.

⁷⁸ PUCN. Docket Nos. 15-07041 and 15-07042. Modified Final Order dated February 12, 2016, *available at* <u>http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-</u> <u>7/9692.pdf</u>. The February 2016 Order is a Modified Final Order relative to a December 2015 initial order with similar changes, but a shorter four-year transition time frame.

http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2017-3/19913.pdf.

A.B. 405 effectively reinstated NEM without additional charges and instituted a modest stepdown in the monthly carryover rate for excess generation.⁸¹

The disruption in the residential solar sector caused by the PUCN's February 2016 decision, the subsequent allowances for NEM applications pending as of December 2015 to enroll in NEM, and the rebound associated with A.B. 405 are all readily visible in the figure below. The delay in the drop off of solar installation numbers in early 2016 is likely attributable to ongoing regulatory activity surrounding legacy rights, including those for NEM applications pending at the time of the initial and modified decisions, which ultimately produced the allowances noted above for those systems.



Figure 8. Residential Solar Adoption in NV Energy

2. SRP in Arizona

In a February 2015 decision, SRP, an Arizona governmentally operated utility, adopted a policy that subjected all new residential DER customers with interconnection applications submitted after December 8, 2014 to a special Customer Generation price plan with mandatory demand rates and a significantly higher fixed charge. The heavy reliance on demand rates and

⁸¹ Nevada Legislature. A.B. 405, enacted June 15, 2017, *available at* <u>https://www.leg.state.nv.us/Session/79th2017/Reports/history.cfm?BillName=AB405</u>.

fixed charges also had the effect of reducing the compensation rate for exports dramatically.⁸² The decision granted legacy treatment to customers with existing interconnection applications and allowed those customers one year (until February 26, 2016) to complete the installation of a legacy system. The timing of the decision relative to the slowing of the growth shows a lag as legacy installations not subject to the new pricing regime make their way into the installed capacity numbers during the first half of 2015. After July 2015, growth slows considerably and persists through 2019, most notably during 2016 and 2017.

Of note, in March 2019 SRP approved additional customer generation pricing plans that do not contain demand charges, a time-of-use Export Price Plan and an Electric Vehicle Export Price Plan, and an alternative demand rate price plan where demand charges are calculated based on average daily on-peak demand.⁸³ It is likely that these new rate options have contributed to the uptick in installation rates seen in 2019.



Figure 9. Residential Solar Adoption in SRP

⁸² SRP Rate Schedule E-27 (Customer Generation Price Plan for Residential Service), *available at* <u>https://www.srpnet.com/prices/pdfx/April2015/E-27.pdf</u>.

⁸³ *Public Pricing Process – More Options for Solar Customers*, SRP, *available at* <u>https://www.srpnet.com/prices/priceprocess/2019/solaroptions.aspx</u>.

3. Hawaiian Electric Company

The Hawaii Public Utilities Commission issued a decision on October 12, 2015 eliminating NEM and establishing two transitional options for DER customers: a Grid Supply Tariff (wholesale credit for exports) and a Self-Supply tariff (no export compensation).⁸⁴ This change led to a significant decrease in installation rates during 2014 and the first part of 2015 attributable to interconnection delays, which produced a queue totaling more than 4,800 customers as of October 2014.⁸⁵ The gradual decline in installation rates after the October 2015 decision reflects the completed installations for systems with applications submitted prior to October 12, 2015 that were permitted to retain access to legacy NEM.



Figure 10. Residential Solar Adoption in Hawaiian Electric Cooperative

B. California's Publicly Owned Utilities

Closer to home, there have been several publicly owned utilities in California that have made major changes to NEM, and the impacts on customer adoption of solar have been

https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A15J13B15422F90464.

⁸⁴ Hawaii Public Utilities Commission. Docket No. 2014-0192. Decision and Order No. 33258, October 12, 2015, *available at*

⁸⁵ Hawaii Public Utilities Commission. Docket No. 2014-0192. HECO Supplemental Responses to Commission Information Requests (a "clear the queue" plan). October 31, 2014, *available at* <u>https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A14K03A94801C05788</u>.

devastating. Three of those utilities are large enough to report data to the federal Energy Information Administration.

1. Imperial Irrigation District

Imperial Irrigation District implemented its transition from NEM in July 2016, replacing it with a net billing program that compensates customers for exports at a current rate of \$0.0698/kWh.⁸⁶ The change in policy produced a dramatic decrease in installation rates beginning in 2017, and a continuing downward trajectory to the low monthly rates indicated during the second half of 2017 that persisted through 2019.



Figure 11. Residential Solar Adoption in Imperial Irrigation District

2. Turlock Irrigation District

Turlock Irrigation District closed NEM effective January 1, 2015.⁸⁷ At the same time, it implemented new tariffs for self-generation customers, which include demand charges for residential customers, mandatory time-of-use rates, and export compensation at the marginal

⁸⁶ *Net Energy Metering*, IID, *available at*: <u>https://www.iid.com/energy/rooftop-solar/interconnection/net-metering</u>.

⁸⁷ TID Electric Tariff, Schedule RNT (Residential Net Metering Option), *available at* <u>https://issuu.com/turlockirrigationdistrict/docs/schedule_rnt_2015_?e=15635682/50057507</u>.

short-run cost of electricity.⁸⁸ The change in policy produced an extreme drop off in residential solar installation rates by mid-2015 through 2017.



Figure 12. Residential Solar Adoption in Turlock Irrigation District

3. Modesto Irrigation District

The Modesto Irrigation District closed its NEM 1.0 tariff effective January 1, 2017.⁸⁹ The NEM 2.0 tariff that replaced it has an export rate design with the export rate set at \$0.076/kWh.⁹⁰ Figure 13 below shows the sharp drop off in installation rates that occurred beginning in mid-2017.

⁸⁸ TID Electric Tariff, Schedule DG (Domestic Self-Generation Service), *available at* <u>https://issuu.com/turlockirrigationdistrict/docs/schedule_dg_2015_?e=15635682/50057312</u>.
 ⁸⁹ MID Electric Tariff, Net Metering 1.0, effective January 1, 2017, *available at*

https://www.mid.org/tariffs/rates/net_metering_1.pdf.

⁹⁰ MID Electric Tariff, Net Metering 2.0, effective July 1, 2020, *available at* <u>https://www.mid.org/tariffs/rates/net_metering_2_202007.pdf</u>. The present export rate of \$0.076/kWh has remained unchanged since NEM 2.0 took effect.



Figure 13. Residential Solar Adoption in Modesto Irrigation District

The experience of these states and utilities cautions against drastic changes to NEM, and demonstrates the need—also enshrined in statute—for any changes to NEM to be reasoned and measured.

VII. CONCLUSION

CALSSA appreciates the opportunity to submit this Proposal and looks forward to presenting it at the March 23-24, 2021 workshops.

Dated: March 15, 2021

Respectfully submitted,

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Attachment A – List of Acronyms

Acronym	Description
A.	Application
AB	Assembly Bill
APR	Annual Percentage Rate
BAs	Balancing Authorities
CAISO	California Independent System Operator
CALSSA	California Solar and Storage Association
CARB	California Air Resources Board
CARE	California Alternate Rates for Energy
CEC	California Energy Commission
CPUC	California Public Utilities Commission
D.	Decision
DER	Distributed Energy Resources
dGEN	Distributed Generation Market Demand Model
E3	Energy and Environmental Economics, Inc.
EV	Electric Vehicle
FERA	Family Electric Rate Assistance Program
GW	gigawatt
IERP	Integrated Energy Policy Report
IID	Imperial Irrigation District
IOU	Investor-Owned Utility
IRP	Integrated Resource Plan
ITC	Investment Tax Credit
Joint IOUs	Southern California Edison Company, Pacific Gas & Electric
	Company, and San Diego Gas & Electric Company
kW	kilowatt
kWh	kilowatt-hour
LADWP	Los Angeles Department of Water & Power
LSE	Load Serving Entity
ME&O	Marketing, Education, and Outreach
MW	megawatt
NEM	Net Energy Metering
NREL	National Renewable Energy Laboratory
NRDC	The Natural Resources Defense Council
PG&E	Pacific Gas and Electric Company
PUCN	Public Utilities Commission of Nevada
R.	Rulemaking
RESOLVE	Renewable Energy Solutions Model
RIM	Ratepayer Impact Measurement
SB	Senate Bill
SCE	Southern California Edison
SDG&E	San Diego Gas and Electric Company
SRP	Salt River Project

TID	Turlock Irrigation District
TRC	Total Resource Cost
TWh	terawatt-hour
VNEM	Virtual Net Metering