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Witnesses:	Paul Chernick and John Wilson

REBUTTAL TESTIMONY OF PAUL L. CHERNICK AND JOHN D. WILSON ON BEHALF OF SMALL BUSINESS UTILITY ADVOCATES

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I. Introduction

Q: Are you the same Paul Chernick and John D. Wilson who filed direct testimony in this proceeding?

A: Yes.

Q: What is the scope of your rebuttal testimony?

A: We respond to the testimony filed by Cal Advocates, CALSSA, Joint IOUs, NRDC, SEIA and Vote Solar, and TURN.

Q: What issues do you address?

A: The Scoping Memo lays out five issues (with numbering starting with number 2) to be addressed in this proceeding.[1] We addressed each of these five issues in our direct testimony. Our rebuttal testimony addresses three of those issues, and we indicate the location in our testimony where each is addressed in the response below.

2. What information from the Net Energy Metering 2.0 Lookback Study should inform the successor and how should the Commission apply those findings in its consideration?
    - We do not have any updates to Section IV of our Direct Testimony.
3. What method should the Commission use to analyze the program elements identified in Issue 4 and the resulting proposals, while ensuring the proposals comply with the guiding principles?
    - Section II updates our recommendations in Sections V and VI of our Direct Testimony.
4. What program elements or specific features should the Commission include in a successor to the current net energy metering tariff?

[1] *Joint Assigned Commissioner Scoping Memo and Administrative Law Judge Ruling Directing Comment on Proposed Guiding Principles* (November 19, 2020).

- Section III updates our NEM Successor Tariff described in Section VII of our Direct Testimony with some new program elements and with support for some elements of other parties' testimony.

5. Which of the analyzed proposals should the Commission adopt as a successor to the current net energy metering tariff and why? What should the timeline be for implementation?

    - The Commission should adopt SBUA's proposal, as described in Section VII and modeled in Section VIII of our Direct Testimony, and as updated with new program elements in Section III of this rebuttal. We discussed compliance with statutory and commission standards in Section X of our Direct Testimony.

    - Section IV describes aspects of other parties' proposals that should not be adopted, and clarifies or slightly modifies elements of our proposal.

6. Other issues that may arise related to current net energy metering tariffs and subtariffs, which include but are not limited to the virtual net energy metering tariffs, net energy metering aggregation tariff, and the Renewable Energy Self-Generation Bill Credit Transfer program.

    - We do not have any updates to Section IX of our Direct Testimony.

Q: How have your recommendations regarding the NEM successor tariff changed since you filed your direct testimony in this proceeding?

A: Our proposal for a NEM successor tariff is largely unchanged. In Section III, we describe two updates to our proposal. First, we support cost-based differences in the customer charge for NEM customers, similar to the current practice of differentiating between single-phase and three-phase service. Second, we support moving NEM customers to critical-peak pricing (CPP) rate design.

In Section III, we also support Cal Advocates' proposal to adopt a storage incentive for NEM 1.0 and 2.0 customers.

In Section IV, we clarify certain elements of our proposal. With respect to our proposed export rate, we suggest updating the avoided costs during Phase 2 General Rate Cases rather than the annual updates suggested in our direct. Otherwise, any clarifications in this section do not reflect alterations of our proposal.

II. Analyzing NEM Successor Tariff Proposals

Q: What program elements or specific features did you recommend that the Commission include in a successor to the current net energy metering tariff?

A: In our direct testimony, we recommended that the Commission should select a proposal that includes the following elements.

- Favors NEM systems that include storage
- Allows NEM storage to charge from the grid
- Maintains an emphasis on volumetric rates
- Provides an adequate payback period, which may vary by customer group

The unifying feature of our direct testimony is an emphasis on maximizing the overall cost-effectiveness of the NEM program while allocating cost recovery responsibility in a manner that reflects customers' use of the grid.

We are generally skeptical of building special payments, such as up-front rebates, into the NEM tariff. If the Commission wishes to facilitate certain customers' installation of renewable generation or storage equipment, it should do so in a program such as the Self-Generation Incentive Program (SGIP) with strict budget limits to control rate impacts.

A. Importance of the Total Resource Cost (TRC) test

Q: What is the appropriate measure of overall cost-effectiveness?

A: As discussed in our direct testimony, the Commission should select a NEM successor tariff that is likely to lead to the majority of NEM systems having a total resource cost (TRC) score of 1.0 or greater, as stated in PUC §2827.1, which states that the tariff should "Ensure that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs," and as the Commission has adopted the TRC score as the primary test for evaluating the

cost-effectiveness of DERs.[2] Similarly, guiding principle (g) directs that the "tariff should maximize the value of customer-sited renewable generation to all customers and to the electrical system."

Q: Should the TRC test screen be applied separately to solar-only and solar+storage technologies?

A: No. For screening purposes, a single NEM program TRC score should be computed for each customer class, including all rate schedules and technology variations, except that disadvantaged customer groups (e.g., CARE) can be considered separately. The analysis should utilize payback periods and PCT scores to make reasonable forecasts of the likely participation levels by technology (solar-only, solar+storage, and other types of NEM systems). In other words, all NEM technologies should be aggregated into a single TRC score when determining whether the overall NEM tariff should be approved, but customer classes should not be aggregated.

Q: Do other parties' testimonies use the TRC perspective to design a strong NEM successor tariff?

A: Many do not. At a high level, we see three categories of problems in other parties' testimony. First, several parties urge the Commission to disregard its prior decisions emphasizing the TRC score, and argue that the RIM score should receive primary consideration. Factually, these arguments overlook the potential for a storage-focused NEM successor tariff to increase the system benefit, as measured by the TRC score.

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[2] The Commission confirmed in D.21-02-007 that cost-effectiveness should be conducted in the manner directed by D.19-05-019, which concluded that the TRC is the primary test for evaluating the cost-effectiveness of distributed energy resources (DERs).

Second, some parties suggest improvements to cost-effectiveness test methods. After reviewing these considerations, we believe the Commission will find that it is impractical to reach definitive findings regarding the cost-effectiveness scores for the NEM program within the schedule for this proceeding.

Third, some parties essentially propose to shut down California's NEM program. Those proposals overlook the potential that without sustained growth in DERs, California may become overly dependent on central, utility-scale solar and storage facilities and the transmission upgrades to support those resources. Even if the required volume of centralized solar were feasible and consistent with Commission and California policy, the cost would be much higher than the avoided generation costs assumed in the TRC computations.

B. Other parties' views on the TRC test

Q: Please discuss the Joint IOUs and TURN's perspectives on the TRC test.

A. The Joint IOUs urge the Commission to disregard D.21-02-007 and D.19-05-019, which found that the TRC is the primary test for evaluating the cost-effectiveness of distributed energy resources (DERs). The Joint IOUs state that the TRC provides "little insight" into the cost-effectiveness of DERs.

> If the Commission focuses exclusively or primarily on the TRC for comparing the cost-effectiveness of party proposals, little insight about the magnitude of the cost shift embedded in each proposal would be gained from the comparison. In the TRC, the benefit of bill savings experienced by the participating customer intuitively cancels out the cost born by other customers of increased rates to maintain the same revenue requirement. Similarly, any incentives in the program are a transfer payment from one group of customers to another.[3]

[3] Joint IOUs, Direct Testimony, p. 88, lines 13-18.

Similarly, TURN states that the TRC test is "not useful for evaluating the differences between successor tariff proposals," and that "the Commission should rely on the RIM and PCT tests to determine the impact of different proposals …"[4] TURN goes no to say that, "The RIM test is the only approach that properly accounts for the impact of NEM tariff design on all customers."[5]

The Joint IOUs and TURN err by suggesting that the Commission should give primacy to the "cost shift," as measured by the RIM test. As we discuss below, the TRC test helps ensure that customers and the utility are investing in resources that benefit the system as a whole. If the NEM program has a TRC score of 1.0 or greater for a customer class as a whole, then the program design should be refined to minimize the cost shift among customers balanced with an intent to maximize overall TRC benefits. Further, TURN errs in suggesting that the RIM test accounts for effects on all customers. The RIM test accounts only for certain effects on non-participants, ignoring the benefits to participants, the utility system as a whole, and the environment.

Q: Please discuss Cal Advocates perspectives on the TRC test.

A: Cal Advocates includes just one paragraph discussing and dismissing the TRC in the midst of an extensive argument that the Commission should emphasize the RIM test.[6] Cal Advocates further dismisses the utility of the TRC test in a footnote, stating that, "Any variations in TRC value among parties' proposals for their successor tariff

[4] TURN, Direct Testimony, p. 12, lines 12-15.

[5] TURN, Direct Testimony, p. 13, lines 24-25.

[6] CalPA, Direct Testimony, p. 5-5, line 10, through p. 5-6, line 3.

design is solely caused by the lack of uniformity in assumptions in the calculation going into the model that each party has chosen to use."[7]

Cal Advocates' characterization of the TRC results is incorrect. As discussed in our direct testimony, adoption of paired-storage systems improves the TRC value in two ways.

- **Increasing the system benefit of whatever storage customers install.** Customers who import energy during low-priced periods and then offset demand or export during high-priced periods will benefit the overall system by reducing demand during peak periods, reducing capacity and average energy costs. Depending on the utility, we calculated that our NEM program design would increase TRC scores by 0.1 to 0.3 as compared to NEM 2.0.[8]
- **Increasing the amount of behind-the-meter storage.** We calculated that solar+storage systems will have a TRC of 1.0 to 1.5, compared to solar-only systems, which we calculated will have a TRC of 0.6 to 1.0.[9]

Thus, Cal Advocates is wrong in claiming that the TRC "cannot be applied to compare the relative merits of different tariffs"[10] and that "[b]ecause the TRC test is unaffected by the choice of successor tariffs, it cannot be relied upon to evaluate competing proposals in this proceeding."[11]

Q: How should the RIM test be used?

A: In our direct testimony, we emphasized that the RIM test (and first-year cost shift) results should be considered third, after using the TRC (or SCT) results to determine overall benefits and confirming that participation is likely to be adequate (as

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[7] CalPA, Direct Testimony, p. 5-6, FN 497.

[8] TRC scores for non-CARE residential systems in 2030. SBUA, Direct Testimony, Table 9, p. 50.

[9] *Id.*

[10] NRDC, Direct Testimony, p. 8, lines 25-26

[11] TURN, Direct Testimony, p. 3, lines 17-19.

estimated from the simple payback results and the participant cost test).[12] The RIM test can be used to guide fine-tuning of rate design, so long as the changes do not significantly decrease the TRC benefits. This approach is consistent with Commission precedents in D.21-02-007 and D.19-05-019, and the efforts by the Joint IOUs, TURN, and Cal Advocates to re-litigate these decisions and establish the RIM test as the primary test should be rejected.

C. Commission evaluation of cost-effectiveness test results

Q: Are there any considerations that would improve the accuracy of the computation of the cost-effectiveness tests?

A: Yes. Attachment RTB-3 to the testimony of SEIA/Vote Solar Witness Beach points out a number of factors that would improve the cost-benefit tests. These include better estimates of costs and some benefit categories, correction of illogical distinctions, and recognition of the non-marginal effect of the NEM program. It is also important for the Commission to consider the impact of changes in rate design when considering the future of the NEM program.

Q: What does SEIA/Vote Solar find with respect to solar costs?

A: Yes, SEIA and Vote Solar present an improved cost forecast and compare the resulting levelized cost of energy (LCOE) to avoided costs for solar-only and solar+storage systems.[13] Their findings suggest that by 2030, both solar-only and solar+storage systems will cost substantially less than avoided costs. The margin for solar+storage is significantly greater than for solar-only, especially when resiliency benefits associated with storage are taken into consideration.

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[12] SBUA, Direct Testimony, p. 16, lines 14-23.

[13] R. Thomas Beach, SEIA and VS, Direct Testimony, Figure 2, p. 19.

If analyzed using SEIA/Vote Solar's cost assumptions, our proposal would likely fare even better for solar+storage. Our proposal has enhanced incentives for customers to use storage a manner that reduces energy and capacity costs for the system. Thus, while SEIA/Vote Solar find a TRC score for solar+storage to be 1.4, adding the impact of those enhanced incentives could increase that score to 1.5 or even 1.7.

Q: What does SEIA/Vote Solar mean by illogical distinction in the avoided costs?

A: Yes. One example offered by SEIA/Vote Solar is that the ACC includes the costs of methane emissions in California, but ignores methane emissions in other locations caused by California electric energy use. The global warming effect of a ton of methane is the same, regardless of whether it is emitted from the gas well in Wyoming, an interstate pipeline in Utah, or an intrastate pipeline in California.

Similarly, the TRC and RIM computations do not recognize the contribution of behind-the-meter renewables to avoiding transmission upgrades to accommodate remote renewables.[14]

Q: What do you mean by the non-marginal effect of the NEM program?

A: In acquiring renewable energy, the LSEs accept the least expensive offers (accounting for other factors) and reject more expensive options. Without behind-the-meter solar, the LSEs would need to procure more renewable energy. Thus, the cost of renewables to replace behind-the-meter resources would be higher than the observed market prices.

In looking at the benefits of small changes in demand and supply, the observed market price is a reasonable proxy for the marginal avoided costs. But for very large

[14] R. Thomas Beach, SEIA and VS, Direct Testimony, Attachment RTB-3, p. 4.

changes, such as eliminating gigawatts of behind-the-meter solar, the cost of the additional renewables is likely to be much higher than the current prices.

As SEIA/Vote Solar points out, California may not have enough available land to meet its renewable energy requirements in the absence of the rooftop and other behind-the-meter resources.[15] That is not a consideration at the level of screening a marginal megawatt of resources, but becomes a very important cost driver if the development of NEM resources is effectively shut down due to onerous rate designs, such as those proposed by the Joint IOUs and TURN.

Q: How will rate design changes affect net metering?

A: The initial introduction of TOU rates in California did not apply full differentiation to reflect marginal costs. It is anticipated that the Commission will continue to guide TOU rates towards a rate design that fully reflects the differences in marginal costs between the rate periods.

To illustrate how significant these changes will be, we present proposed rates from the PG&E Phase 2 General Rate Case for Schedules B-1 and B-6, which are available to small commercial customers. Schedule B-6 is an optional rate available to customers who would otherwise default to Schedule B-1. The proposed C&I settlement for Schedule B-6 will result in a substantial shift towards fully Equal Percentage Marginal Cost (EPMC)-scaled TOU rate differentials.[16]

As illustrated in Table 1, the inter-period rate differentials will be much larger in Schedule B-6 than in Schedule B-1. As other rates are shifted towards more fully-differentiated designs, and more NEM customers use these rates as their underlying

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[15] R. Thomas Beach, SEIA and VS, Direct Testimony, Attachment RTB-3, p. 4.

[16] PG&E, Commercial and Industrial Rate Design Supplemental Settlement Agreement, A. 19-11-019 (April 13, 2021), Attachment 1, p. 7.

rates, there will be a substantial change in the economics of the NEM tariffs that are not reflected in the analyses using the E3 or other parties' models.

Table 1: PG&E Proposed Energy Charge Rates, 2020 Phase 2 General Rate Case ($/kWh)[17]

TOU Period	Schedule B-1 Default Small Commercial Rate	Schedule B-6 Optional Small Commercial Rate More Fully EPMC-Scaled Rate Differential
Summer On-Peak	$ 0.323	$ 0.482
Summer Part-Peak	$ 0.280	$ 0.243
Summer Off-Peak	$ 0.259	
Winter On-Peak	$ 0.253	$ 0.264
Winter Off-Peak	$ 0.237	$ 0.220
Super-Off-Peak	$ 0.221	$ 0.184

It is likely that the shift toward more fully-differentiated rates will increase bills for solar NEM customers, as rates in periods with high solar output (e.g., the summer off-peak) fall and rates in periods with low solar output (e.g., the summer peak) rise. This will substantially affect the RIM test results. The availability of PG&E Schedule B-6 will provide the Commission and other parties an opportunity to better understand customer response to more fully-differentiated rates, as provided by the settlement agreement's reporting requirements.[18]

[17] PG&E, Response to SBUA DR-007, PG&E Phase 2 General Rate Case, A.19-11-019, Question 1 (June 30, 2021), workbook GRC-2020-PII_DR_SBUA_007-Q01Rev01Atch01.xslx, worksheet PGE, cells N24:N30, N61:N67.

[18] PG&E, Commercial and Industrial Rate Design Supplemental Settlement Agreement, A. 19-11-019 (April 13, 2021), Attachment 1, p. 8.

Q: How should the Commission consider these proposed improvements to the cost-effectiveness results?

A: It is probably impractical for the Commission to make an exact determination of the TRC scores for the overall NEM program, for the following reasons:

- The cost-effectiveness test scores that we, and other parties, suggest are based on models that depend on numerous assumptions and algorithms. Reaching findings on each of these assumptions and algorithms may be difficult. Even with the extensive testimony submitted in this proceeding, the record is very thin on many of the factual matters (e.g., feasibility and cost of expanding utility-scale renewables to replace BTM resources, the contribution of BTM resources to resiliency).
- The rates and rate designs that the Commission approves in the future substantially affect both cost-effectiveness test scores and payback periods, which is the best indicator of potential adoption rates for NEM systems. While the general direction of rate design (more time-of-use differentiation, better matching of rate periods to costs) can be anticipated, even the Commission cannot know the rate and magnitude of those changes in future years.
- Even if the Commission were to reach findings regarding the present and future cost of solar, storage and other NEM technologies; the benefits of NEM; and future rates and rate designs, it would have to account for the wide variation in NEM system installations. Many characteristics of NEM systems—such as solar panel orientation and shading, the size and operating algorithms for storage—are not modeled well by an archetypal system model.
- Even if the Commission were to reach findings and consider a reasonable variety of system configurations, there is great uncertainty in the market. The Commission cannot estimate with reasonable certainty which of those system configurations will be adopted in the future, or in what proportions. The TRC score for a NEM program with 90% solar+storage will be very different than if solar+storage makes up only 10% of the market.
- Finally, because the NEM program is such a substantial part of California's overall resource plans, major changes to this program will have a substantial influence on future avoided cost rates. As avoided costs shift, this changes both the results of the cost-effectiveness scores and, through program revisions, feeds back to influence customer adoption rates.

Instead of attempting to reach definitive findings regarding the cost-effectiveness of the NEM program, the Commission should weigh the evidence, both quantitative and qualitative, regarding the key factors that will drive NEM program cost-effectiveness. It should approve a NEM successor tariff that is likely to result in the greatest net benefits, as measured by the TRC test.

D. Shutting down California's NEM program is unrealistic and inconsistent with state policy

Q: Do some parties essentially propose to shut down California's NEM program?

A: Yes. The Joint IOUs and TURN effectively propose to shut down California's NEM program. As discussed in our direct testimony, the payback period is the best measure of customer adoption. In our direct testimony, we analyzed payback period data from across the country to determine the relation between payback periods and solar uptake. The payback periods contemplated by the Joint IOUs (11-19 years)[19] and TURN (over 20 years, potentially as high as 41 years)[20] could reduce solar uptake by 95% – 99%, compared to the acceptance level of a five-year payback.

Q: Is a shutting down California's NEM program consistent with Commission and California energy policy?

A: No. To give just one example, the title of the Commission's recent Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future is clear evidence of the Commission's expectations. While the OIR is not intended to set policy regarding the quantity of DERs, it recognizes a need to prepare

[19] Joint IOUs, Direct Testimony, Table IV-4, p. 105.

[20] TURN, Direct Testimony, p. 69, line 1.

"the grid to accommodate what is expected to be a high DER future …"[21] Explaining its growth expectations for a "high DER future," the Commission notes that,

> The CEC's 2020 Integrated Energy Policy Report forecasts extensive increases in behind-the-meter (BTM) solar generation (260 percent), BTM energy storage capacity (770 percent), … from 2019 to 2030.[21]
>
> [21] BTM solar generated 15,800 GWh in 2019 and is forecast to generate 41,200 GWh by 2030 (mid case). BTM energy storage capacity was 340 MW in 2019 and is forecast to reach 2,600 MW by 2030 (mid case)…[22]

In order to meet the forecast of 41,200 GWh, California's BTM solar generation will need to grow from 9.4 GW in 2019 to around 24.5 GW in 2030, an increase of 15.1 GW. Even the Cal Advocates proposal to curtail NEM (which is less extreme than the proposals from TURN and the Joint IOUs) would result in far less BTM solar capacity than the CEC target. Cal Advocates states "that more than 5.6 GW of residential renewable capacity could be installed by 2030 under [its] proposed tariff."[23] That is just 37% of the amount that the CEC forecast; curtailing NEM solar as Cal Advocates proposes could require adding a gigawatt of utility-scale solar (and associated storage) each of the next ten years to make up the difference.

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[21] CPUC, Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future (June 24, 2021), R.21-06-017, p. 10, citing *Final 2020 Integrated Energy Policy Report Update Volume III California Energy Demand Forecast Update*, March 23, 2021, TN #237269.

[22] *Id.,* p. 8.

[23] Despite this discrepancy, Cal Advocates asserts that its modeling using the National Renewable Energy Lab's Distributed Generation Market Demand (dGEN) tool indicates "that the Commission can implement Cal Advocates' proposals and achieve the State's goals." Cal Advocates Direct Testimony p. 5-11, lines 3-12. Note that the vast majority of NEM solar capacity is residential.

Q: Why is it important that California's NEM program continue to demonstrate sustained growth?

A: SEIA and Vote Solar present compelling testimony "that there will be significant land use constraints on utility-scale solar deployment in the period from 2030-2045." These forecast constraints are considerable even with the roughly 40 GW of DER generation forecast by 2045.[24]

Achieving the forecast 92 GW of utility-scale solar by 2045 will be difficult, considering that the estimated land use constraints developed by Black & Veatch in 2016 limit utility-scale solar to between 38 and 81 GW.[25] The SEIA/Vote Solar testimony further explains that since Black & Veatch developed those land use constraint estimates, two significant conservation measures could further tighten those constraints.[26]

CALSSA also reasonably connects land conservation to the unknown transmission development needed to support 92 GW of utility-scale solar.[27] This transmission requirement will be even greater due to the substantial need to develop storage across the state. In the Integrated Resource Planning process and in Phase 2

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[24] The 40 GW estimate considers the difference between the No New DER Case (131 GW) and the 2019-2020 Reference System Portfolio (92 GW). As summarized in R. Thomas Beach, SEIA and VS, Direct Testimony, Attachment A to Attachment RTB-2, Table A-2, p. A-3.

[25] As summarized in R. Thomas Beach, SEIA and VS, Direct Testimony, Attachment A to Attachment RTB-2, p. A-1 and Table A-1, p. A-2.

[26] The California Fish and Game Commission's listing of the Western Joshua Tree as a candidate threatened species, and its continued review of permanent designation (https://fgc.ca.gov/CESA#wjt), would result in limits on utility-scale solar development. Governor Newsom's executive order to conserve 30% of the state's lands could add further limits (www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-signed.pdf).

[27] CALSSA, Direct Testimony, p. 82, lines 6-7.

General Rate Cases, the Commission has identified storage as the principal resource that will provide future capacity. For example, the base case portfolio adopted by the Commission in D.21-02-008 for the 2021-2022 Transmission Planning Process (TPP) includes 9 GW of new battery storage, 16 GW of new in-state renewables, and geothermal and pumped storage resources.[28] About 69 GW of battery storage is required by 2045 in one scenario studied in the 2045 Framing Study as part of the 2019-2020 Reference System Portfolio development.[29]

While the Joint IOUs and TURN express reasonable concern about the "cost shift" resulting from NEM adoption, they do not address the resource shift and attendant costs that would result from virtually eliminating residential (non-CARE) net metering. Instead of individual customers and solar developers financing NEM generation on rooftops and other customer-sited properties, utilities and major developers will need to increase the pace of utility-scale solar and storage development with the attendant transmission requirements. The resource shift that would result from effectively eliminating net metering could be costly to all California utility customers, including small businesses.

As SEIA/Vote Solar Witness Beach aptly puts it, it would be a serious error to put all the eggs in the utility-scale basket.[30] The "Commission is not authorizing procurement based on the IRP's No New DERs scenario."[31] Indeed, if the Commission adopts the proposal of either the Joint IOUs or TURN, it will need to

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[28] See also the proposed decision on mid-term reliability, R.20-05-003 (May 21, 2021), pp. 39–40.

[29] CPUC Energy Division, "2019-20 IRP: Preliminary Results" (October 4, 2019), p. 116.

[30] R. Thomas Beach, SEIA and VS, Direct Testimony, p. 7, line 21.

[31] R. Thomas Beach, p. 23, lines 23-24.

immediately revisit its IRP in order to authorize additional resource procurement and transmission buildout to replace the DERs that would be lost.

III. Updates to Program Elements and Features in SBUA's NEM Successor Tariff Proposal and Areas of Agreement With Other Proposals

A. Customer Charge

Q: What do you mean by the customer charge?

A: Utility tariffs include either a daily/monthly customer charge or set a monthly minimum based on per-customer charges. These charges are generally intended to recover the costs of customer access, such as the service drop and meter investment, billing, and meter reading. In this subsection, we address potential NEM-specific elements of these customer charges.

Q: What parties discuss NEM-specific customer costs and charges?

A: Cal Advocates notes in passing that NEM customers likely have higher marginal customer access costs (MCACs) than non-NEM customers.[32] However, Cal Advocates' proposal does not appear to act directly on this point. PG&E does suggest differentiating between NEM and non-NEM customers based on these different MCACs.[33]

Q: What is your perspective on this issue?

A: A cost-based differentiation between NEM and non-NEM customer charges could be just as appropriate as other cost-based differences in customer charges, such as single-phase vs three-phase service.

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[32] Cal Advocates, Direct Testimony, p. 3-30, lines 6-8.

[33] Joint IOUs, Direct Testimony, p. 112, lines 7-13.

Any such NEM customer charge should be cost-based and strictly limited to the existing cost categories that are currently allocated on a per-customer basis. A further enhancement might be to increase the customer charge for NEM customers who do not install a smart inverter, if those are not required by Rule 21.

B. Mandatory CPP rate use

Q: Please discuss your proposal to require mandatory CPP rate use.

A: In our direct testimony, we proposed that the NEM successor tariff should require use of rates that maximize TOU-differentiation consistent with marginal costs, such as PG&E Schedule B-6 discussed above. The Joint IOUs generally agree with requiring fully-differentiated rates, although SDG&E's proposal does not include differentiation of distribution rates.[34] Similarly, SEIA/Vote Solar notes that rates with high differentials drive deployment of solar+storage, "because these rate differences are the key economic driver encouraging customers to cycle their storage regularly, charging in off-peak hours and discharging the stored energy to meet peak demands."[35]

SEIA/Vote Solar also recommends that NEM customers "should be allowed to elect CPP or PDP rates on any rate option that they select."[36] Considering this recommendation we see no reason not to go further: Consistent with requiring rates with high differentials concept, we amend our proposal to include moving toward mandatory application of CPP rates for NEM customers.

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[34] Joint IOUs, Direct Testimony, p. 117, Table IV-18.

[35] R. Thomas Beach, p. 41, lines 13-17.

[36] R. Thomas Beach, p. 74, lines 8-10.

CPP events signal an even more urgent need for customers to conserve energy and use storage resources consistent with economic signals. When CPP events are called, customers with storage resources will have an incentive to conserve energy prior to the CPP event in order to maximize stored energy that can be discharged during the CPP event. Making the use of CPP rates mandatory for NEM customers would further minimize stress on the grid during these critical periods.

At a future date, the Commission may also wish to encourage day-ahead hourly real-time pricing (DAHRTP) rates for customers with NEM-paired storage, along the lines of rate designs proposed by PG&E.[37]

C. Storage Incentive for NEM 1.0 and 2.0

Q: What is your opinion of the storage incentive proposed by Cal Advocates for NEM 1.0 and 2.0 customers?

A: We generally support Cal Advocates' proposal to offer an incentive for customers under NEM 1.0 or 2.0 to transition to the NEM successor tariff, potentially by installing storage systems.[38]

However, we do not believe that the program should cost the $2.8 billion cost that Cal Advocates suggests. If participation interest is so high that all participants are likely to accept the incentive in the first two years, then the incentive level was set too high. While we agree that it makes sense to encourage switching to the

[37] PG&E's Commercial Electric Vehicle RTP Rate Pilot (A.20-10-011) and Phase 2 GRC (A.19-11-019). We would note that if a customer chose to use or was mandated to use a DAHRTP rate with the NEM system, the customer would need to shift to hourly netting rather than daily TOU netting.

[38] Cal Advocates, Direct Testimony, p. 4-2, line 17 through p. 4-10, line 2. The proposal is also supported by R. Thomas Beach, SEIA and Vote Solar, Direct Testimony, p. 42, lines 10-14; NRDC, Direct Testimony, p. 23, lines 7-9.

successor tariff, the incentive levels should be made more variable and responsive to customer interest based on a budget.

IV. Aspects of Other Parties' Proposals that Should Not Be Adopted in the NEM Successor Tariff

A. Instantaneous netting

Q: Please summarize the proposals for instantaneous netting.

A: Cal Advocates, TURN, and the Joint IOUs propose to use instantaneous netting. Instantaneous netting is defined in Cal Advocates testimony as follows:

> Any on-site generation that occurs *in excess* of the customer's consumption in real time is exported to the grid and is captured in Channel 2 readings (net exports). Any on-site generation occurs *simultaneously* with a customer's consumption and up to the customer's instantaneous demand is consumed on-site, which automatically reduces the kWh that are delivered from the utility to the customer, i.e., their Channel 1 meter readings.[39]

The intent of TURN and the IOUs appears similar.

However, all three parties rely on hourly, not instantaneous data to support their proposals. We are not aware that any party has utilized any instantaneous data in developing or analyzing their proposal, or determining the impact of instantaneous netting on customer bills.

Q: Why should the Commission reject instantaneous netting?

A: Instantaneous netting should be rejected because it:

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[39] Cal Advocates, Direct Testimony, p. 3-6, line 6 through p. 3-7, line 7. TURN, Direct Testimony, p. 45, lines 17-18. TURN confirmed that it agrees with the definition provided by Cal Advocates in TURN, Response to SBUA DR 1 (July 12, 2021). The Joint IOUs appear to use a similar definition. Joint IOUs, Direct Testimony, p. 100, lines 1-3.

- Is not supported in this proceeding by any analysis,
- Creates unreasonable challenges for solar installers and customers to obtain and analyze such data to forecast project economics,
- Does not improve the efficiency or equity of the rate design, and
- Does not provide any mechanism for customers to manage energy use instantaneously.

The challenge of working with instantaneous data is exhibited by this proceeding. Since neither the IOUs nor any other party were able to obtain and model instantaneous data, how can solar installers and customers be expected to do so?[40]

If a customer wished to avoid exporting power on an instantaneous netting rate, that customer would need to continuously monitor both solar output and electricity use. Even if the customer chose to shift electricity use to peak solar periods, it is likely that the customer would have some intervals in which electricity use dipped below solar production. For example, a residential customer using a dishwasher, washing machine, and hot water heater would have periods when none of those three appliances were using power at peak levels. The dishwasher and washing machine, in particular, draw little power during some portions of their cycles.

As discussed in our direct testimony, short-term fluctuations in individual customers' net load, as refrigerators and air conditioners switch on and off, have little effect on generation loss-of-load-expectation (LOLE) or cost, or distribution overloads, which are generally important only over extended periods. Approval of an instantaneous netting period would encourage customers to waste their effort and money on enabling technologies (storage and automatic controls) to smooth out inconsequential variation.

[40] The IOUs and TURN do not ask that question, since they are content with no new NEM installations.

B. Export rate

Q: Why should the Commission reject the Joint IOUs and Cal Advocates proposals to use export or production-weighted avoided costs for the export rate?

A: We continue to favor a simple TOU period averaging method for the avoided cost export rate. While we understand the rational for weighting avoided cost rates by an export profile, as suggested by the Joint IOUs, export weighting creates problems and the underlying issue should be resolved within a few years.[41] Cal Advocates also suggests production-weighted avoided costs, but only for the midday solar production period.[42] We have two issues with these proposals.

First, simple averaging avoids the complexity of setting prices for a variety of profiles for different solar orientations, different shading patterns, solar-only and solar+storage installations, and non-solar behind-the-meter resources. Considering that the ratio of solar to storage in NEM-paired storage systems will vary widely, it seems impractical to generate an export-weighted solar+storage profile for purposes of developing an appropriate export-weighted avoided cost.

Second, the concern that drives these proposals should be resolved within a few years because it is an artifact of the transition to mandatory TOU rates. The main issue raised with respect to simple averaging is customers might be overpaid at the beginning of the on-peak period.[43] However, this is a result of the misalignment of the current TOU periods, which should be shifted later in the day based on data from

[41] Joint IOUs, Direct Testimony, p. 125, lines 8-10.

[42] Cal Advocates, Direct Testimony, p. 3-16, lines 9-11.

[43] Joint IOUs, Direct Testimony, p. 126, lines 10-12.

all three IOUs.[44] By the time the NEM successor tariff is in place, the IOUs will be preparing to file new rate cases in which they should correct this misalignment.

Q: Do you have any comments on the proposals of various parties for updating the export rate, based on changes in avoided costs?

A: Yes. SEIA and Vote Solar Witness Gallagher discusses concerns regarding annual updates to the export rate based on the CPUC Avoided Cost Calculator. He explains that updating the export rate annually "could result in huge and unpredictable swings for solar customers."[45] CALSSA states that while "customers have experience with gradually increasing rate[s]," they "will have no confidence in an obscure calculator that has never been used for setting rates."[46]

While these concerns have merit, linking the export rate to current market and system conditions can improve pricing signals. Our proposal to allow charging and re-export of NEM-paired storage from the grid assumes that the compensation for re-exported power is reasonably aligned with market value. The avoided cost rate is one way to provide that pricing alignment.

One reasonable resolution of this concern would be to update the export rate less than annually, such as in each Phase 2 General Rate Case. This would synchronize export rate updates with to other rate updates, which would be more understandable to customers. The Commission could review any issues with the application of the avoided cost calculator for purposes of ratesetting and allow parties

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[44] SBUA, Direct and Reply Testimonies, R.20-11-003 (January 11 and January 19, 2021), pp. 11-18 and 12-16, respectively.

[45] Sean Gallagher, SEIA and Vote Solar, Direct Testimony, p. 9, lines 16-18.

[46] CALSSA, Direct Testimony, p. 20, lines 5-7.

to propose alternative export rates that might be substituted for the avoided cost calculator results.

C. NEM generation charge

Q: Please discuss the difference between the NEM generation charge in your direct testimony and the grid benefits charge proposed by the Joint IOUs and Cal Advocates.

A: The Joint IOUs and, to a lesser extent, Cal Advocates propose a grid benefits charge that would effectively transform NEM into a buy-all/sell-all relationship. The basic premise is that NEM customers should pay for self-generation at the same rate as utility-supplied power, net of avoided costs. This is mathematically equivalent to a buy-all/sell-all relationship.

Our recommended NEM generation charge would not replicate a buy-all/sell-all relationship. Instead, we are recommending that the Commission open a Phase 2 of this proceeding to determine the specific costs that should be included in a NEM generation charge and the basis on which individual customers should be assigned such a charge.

Accordingly, we agree with SEIA/Vote Solar that any charge on solar capacity should not be labeled with the word "benefits." All charges to customers are intended to recover costs associated with customer benefits, and as Witness Beach aptly put it, "customers pay for that benefit only when they actually use the grid to import electricity into their premises."[47]

First, we believe it is appropriate to reduce the revenue transfer from NEM customers to other customers. We also recognize that NEM customers – in the

[47] R. Thomas Beach, SEIA and Vote Solar, Direct Testimony, p. 68, lines 6-10.

aggregate – have load shapes that may impose different costs per kWh for generation, distribution, and transmission capacity.[48]

Second, we agree with the Joint IOUs and Cal Advocates that it is reasonable to collect non-bypassable charges (NBCs) from NEM customers as they are collected from other customers who self-generate (e.g., departing load customers).

Q: Do you support the grid benefits charge proposed by the Joint IOUs?

A: No. The Joint IOUs propose to treat each individual NEM customer as requiring full and simultaneous backup service by the utility for all power generated and consumed behind the meter. The Joint IOUs essentially argue for a buy-all, sell-all arrangement. Cal Advocates' approach is similar, except that their proposal would excuse NEM customers from paying backup charges for the MGCCs.

In the case of distribution capacity, the Joint IOUs not only suggest that "distributed solar does not decrease the need for the utility to invest in distribution infrastructure," but also that they require "additional services for accommodating exported energy."[49] The Joint IOUs do not provide any documentation for their claims about the effect of solar and storage facilities on distribution costs. It seems very likely that greater load diversity on a circuit due to solar and solar+storage systems, as well as storage discharge offsetting peak loads, would reduce the overall distribution requirement. Both improved TOU periods and increased storage capacity

[48] An alternative to a cost-based generation charge would be to assign NEM customers to a separate rate class and develop TOU rates based on class-allocated costs.

[49] Joint IOUs, Direct Testimony, p. 139, lines 21-22; p. 140, lines 4-5.

would enhance the distribution savings.[50] And as mentioned above, short-term fluctuations in individual customers' net load have little effect on system costs.

As flimsy as the Joint IOUs' argument is with regard to distribution costs, it is even less substantial for transmission. The Joint IOUs justify assigning full responsibility for transmission cost recover based on onsite consumption "[b]ecause these projects benefit all customers."[51] Regardless of whether the transmission benefits the NEM customers, if the DERs (especially storage) reduce the contribution to the regional high-load hours that drive transmission investment, the load served behind-the-meter does not increase transmission costs and should not be charged for them. Depending on the dispatch of storage, the NEM customers may reduce need for transmission.

The same is true for the paucity of explanation and evidence for recovery of generation capacity costs from NEM customers.[52] If the behind-the-meter generation is operating in the hours of high LOLE, the NEM customer is reducing generation capacity costs. As for transmission and distribution costs, a NEM generation charge should only recover costs that are reasonably assigned to the NEM customers – in the aggregate – based on their actual load profile.

The Joint IOUs have not provided a sufficient cost basis to support their proposed grid benefits charge. Our proposal would set the NEM generation charge to recover the costs driven by NEM customers, based on the Commission's cost

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[50] In the absence of storage, concentrations of distributed solar can sometimes result in power flow towards the substations exceeding peak net load, especially without meaningful time-varying price signals. Again, storage, pricing improvements and electrification can reduce those situations.

[51] Joint IOUs, Direct Testimony, p. 140, lines 12-23.

[52] Joint IOUs, Direct Testimony, p. 141, lines 5-8.

determination of the aggregated costs and reflecting the effect of NEM-paired storage, resulting in a charge with a reasonable cost basis.

Q: Are there problems with the Joint IOU's method for calculating the cost responsibility for NEM customers?

A: Yes. The Joint IOUs' proposed charge is based on inexact assumptions about how much DER energy a customer uses behind the meter. The Joint IOUs assume a capacity factor and a percent of onsite consumption. These are likely to vary substantially from customer to customer, but the Joint IOUs are apparently proposing uniform values across all customers.[53]

The proposal is even worse for solar+storage customers. Even though customers with NEM-paired storage should require less distribution, transmission and generation capacity, the Joint IOUs suggest that those customers should be charged *even more* than solar-only customers. Initially, it appears that the Joint IOUs propose to adopt the same charge for solar-only and solar+storage customers, but would "refine" that charge over time to recognize that solar+storage customers would consume more energy onsite.[54] In effect, solar+storage customers would be penalized for investing in storage – the opposite of what the Commission should encourage.[55]

Q: What about Cal Advocates' proposed grid benefits charge?

A: Cal Advocates' proposal suffers from similar problems. Cal Advocates also seeks to recover a charge for distribution and transmission costs, but unlike the Joint IOUs its charge does not include generation. Cal Advocates determines the cost of service for

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[53] Joint IOUs, Direct Testimony, p. 138, lines 16-20; p. 141, lines 10-12.

[54] Joint IOUs, Direct Testimony, p. 139, lines 2-6.

[55] Nor do the Joint IOUs give any credit to customers for the value of smart inverters, which provide benefits to the distribution grid.

these costs on a per customer basis, which is different from non-NEM residential customers, who are charged based on electricity use.[56]

Other key assumptions used in determining the residential charge include the average solar PV size, the NEM 2.0 annual bill deficit as determined in the Lookback Study, and the average residential NEM 2.0 annual export percentage.[57] It is not clear whether Cal Advocates intends that these assumptions would or should ever be updated. Furthermore, Cal Advocates' testimony does not even discuss the impact of such a charge on storage, such as whether it would be uniform across solar-only and solar+storage customers.

Cal Advocates uses a different method for calculating a monthly charge for NBCs than for the remainder of its grid benefits charge, but it amounts to much the same result. While it is styled as a per-kWh charge to distinguish it from the per-kW charge for distribution and transmission costs, system production is estimated based solely on the customer's PV system size, so it is actually also a per-kW charge.[58]

Q: Have the Joint IOUs or Cal Advocates met the statutory standard for charging NBCs based on actual usage?

A: No. The Joint IOUs acknowledge that PUC § 381(a) establishes that some NBCs are to be collected on the "basis of usage" but claim that "estimated onsite consumption will satisfy this requirement, similar to how standby departing load customers are

[56] Cal Advocates, Direct Testimony, p. 3-42, lines 10-11.

[57] Cal Advocates, Direct Testimony, p. 3-40, lines 24-25, p. 3-41, lines 1-3, p. 3-43, FN 287.

[58] Cal Advocates, Direct Testimony, p. 3-39, lines 21-22. As discussed below, Cal Advocates proposes allowing customers to install a utility-grade meter if they prefer to be billed for NBCs on the basis of actual kWh.

currently assessed NBCs."[59] However, departing load customers are charged NBCs on the basis of *customer-specific* billing determinants.[60] As discussed above, the Joint IOUs propose to determine a customer's "estimated onsite consumption" using system-wide assumptions of performance that, in fact, vary substantially from customer to customer.

Cal Advocates proposes to work around this issue by allowing a customer the option of installing a "separate, utility-grade meter to track on-site consumption."[61] This could be a costly and burdensome choice. Otherwise, its solution is the same as the Joint IOUs, to assume customer on-site consumption based solely on the customer's PV system size.

We also note that both parties would charge NBCs on the portion of self-generation that is lost in the process of storing and recovering electricity from the battery, which surely is not "usage."

The Commission should recognize that it needs a more customer-specific basis for calculating behind-the-meter usage, while recognizing that it should not be burdensome to the utility or customer.

Q: What is a more reasonable cost basis for a NEM generation charge?

A: We have not developed a detailed proposal, but recommend that the Commission consider this issue in a Phase 2 of this proceeding. The Commission should examine the following questions.

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[59] Joint IOUs, Direct Testimony, p. 139, lines 15-18.

[60] See, for example, PG&E Schedule E-DCG and Electric Preliminary Statement Part BB.

[61] Cal Advocates, Direct Testimony, p. 3-39, lines 21-22.

1. What is the change in transmission, distribution, and generation costs for a customer served by NEM generation as compared to a customer who is not?
2. How much does this cost difference vary based on the size of the NEM system, its capacity factor, and the percentage of customer load served on-site?
3. How should NEM-paired storage be considered, including treatment of losses due to round-trip efficiency battery losses?
4. If system generation or onsite consumption were to be used to determine the appropriate charge, how should those values be calculated? For example, is a utility-grade meter necessary or is there some reasonable alternative that does not rely on system-wide averages?
5. How should transmission, distribution and generation costs be billed to NEM customers (per customer, per nameplate kW, per onsite consumption)?
6. How should NBCs be billed to NEM customers to best reflect actual energy usage?

D. Treatment of non-residential NEM customers

Q: How do other parties propose to treat non-residential NEM customers?

A: Some parties agree with us that, at least initially, non-residential customers should remain on rates very similar to NEM 2.0. The non-residential NEM market is a small fraction of the overall market. SEIA/Vote Solar states that "the non-residential market should remain under the current NEM 2.0 tariff."[62]

Similarly, CALSSA states that, "The NEM-3 tariff for commercial and agricultural customers should be identical to the NEM-2 tariff, a position supported by the E3 white paper."[63] CALSSA also proposes that non-residential VNEM should be treated the same as residential VNEM systems that are not located in

[62] R. Thomas Beach, SEIA and Vote Solar, Direct Testimony, p. 58, lines 9-10.

[63] CALSSA, Direct Testimony, p. 17, lines 8-9.

disadvantaged communities (DACs).[64] We agree with CALSSA that non-residential VNEM systems should be treated the same as non-DAC residential VNEM systems.

However, the Joint IOUs propose to apply most of their onerous proposal to non-residential customers. The Joint IOUs do acknowledge that "Non-residential base rate structures are typically more cost-effective" and that "Verdant [in the Lookback Study] makes the point that the burden of the NEM cost shift is mitigated in the non-residential class due to fixed and demand charges."[65] The only difference between the Joint IOUs' residential and non-residential proposals is a limit of the grid benefits charge to volumetric charges.[66]

For many of the non-residential rates, Joint IOUs propose to charge even *more* per kW of solar capacity than for residential customers.[67] As discussed above, the Joint IOUs have not justified the cost basis for the grid benefits charge. The suggestion that the utilities should charge non-residential customers even more to install the same PV system that might also be installed on a residential customer site should give the Commission even further cause to reject their proposal.

Cal Advocates would also have the same NEM successor tariff for residential and non-residential customers, except that it would temporarily waive the distribution and transmission grid benefits charge to non-residential customers.[68]

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[64] CALSSA, Direct Testimony, p. 26, lines 1-6.

[65] Joint IOUs, Direct Testimony, p. 144, lines 2-3, 17-18.

[66] Joint IOUs, Direct Testimony, p. 147, lines 19-22.

[67] Non-residential charges are higher for 5 of 14 PG&E tariffs and 8 of 13 SDG&E tariffs. Comparing Table IV-28 with Tables IV-30, 31, and 32. (All of the SCE non-residential charges are lower than the residential charge.)

[68] Cal Advocates, Direct Testimony, p. 3-45, lines 5-6.

E. Grid charging of storage

Q: What do other parties have to say about grid charging of NEM-paired storage?

A: TURN's testimony appears to be the only other testimony that discusses the relationship of storage to the grid. Unfortunately, TURN would impose additional obligations on customers with NEM-paired storage while maintaining the requirement that storage may only charge from solar.[69]

TURN suggests *requiring* paired storage to discharge to the grid during "certain extreme system stress and emergency conditions in support of overall grid needs."[70] Under this proposal, the NEM customers would be required to surrender their buffer of energy resiliency when the grid needs it, but would be prohibited to topping off their storage from the grid when they are heading into a PSPS or other possible disruption.

TURN's proposal is egregious and should be rejected.

F. Transition period

Q: Do some parties propose to fully transition to a NEM successor tariff immediately?

A: Yes. Cal Advocates, the Joint IOUs and TURN are examples of parties that propose to fully implement their proposal very soon after the final decision, in 2022 or 2023.[71]

This would be wholly unreasonable for both customers and for solar contractors. As CALSSA's testimony points out, "*the day after* the Commission's

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[69] TURN, Direct Testimony, p. 24, lines 22-25.

[70] TURN, Direct Testimony, p. 57, lines 5-7.

[71] Cal Advocates, Direct Testimony, p. 6-1, lines 19-23; Joint IOUs, p. 182, line 15 – p. 185, line 17; TURN, Direct Testimony, p. 60, line 13.

decision is issued in the case, the Joint IOUs would expect solar companies to be able to understand each aspect of the Commission's decision, guess at the implementation details that may come out of that decision, and then communicate those details to their customer relations teams."[72] If the Joint IOUs proposal were to be adopted, solar installers and contractors (many of which are small businesses) are likely to see their pending customers canceling orders and new leads drying up, due to the unattractive payback periods; rather than retraining their employees, the installers are likely to be laying them off.

Q: What transition approach does SBUA recommend?

A: In our direct testimony, we proposed a "glide path" for all solar-only customers by shifting gradually from annual, to monthly, and ultimately to daily netting periods.[73] Residential non-CARE, solar-only customers would begin at monthly netting and be shifted to daily netting relatively quickly, once the market has adjusted to the new rate design.

Other customer groups would transition more slowly, except that all customers with NEM-paired storage would be transitioned to daily netting contemporaneously with allowing charging from the grid and making other key tariff changes.

We view the need for a transition period both as a caution and a challenge. As SEIA/Vote Solar's testimony explains, the transition in other markets, such as Hawaii, has been slow.[74]

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[72] CALSSA, Direct Testimony, p. 45, lines 17-21.

[73] SBUA, Direct Testimony, p. 41 – p. 42.

[74] Will Giese, SEIA and Vote Solar, Direct Testimony, p. 10, lines 10-15.

As CALSSA points out, the transition to solar+storage is particularly perilous for small contractors, who will face greater training, permitting, and supply chain challenges than the large national solar providers will face.[75] More generally, permitting and interconnection process take longer for solar+storage than for solar.[76] These factors will delay the transition to solar+storage and the Commission should not put California's existing solar industry in jeopardy just when it is needed most.

On the other hand, the transition period should be structured to challenge customers and the industry to make the transition to solar+storage as rapidly as possible. Perhaps one reason that the adoption of NEM-paired storage has lagged in locations such as Hawaii is the continuing availability of rates that provide reasonable paybacks with solar-only installations. By shifting to a scenario that favors solar+storage but does not shut down solar-only installations, the Commission can drive the market transition as rapidly but smoothly.

Q: Does this conclude your testimony?

A: Yes.

[75] CALSSA, p. 42, lines 7-9.

[76] CALSSA, p. 43, lines 3-5.