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Witnesses:	Brad Heavner

PREPARED REPLY TESTIMONY OF THE
CALIFORNIA SOLAR & STORAGE ASSOCIATION

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of an Extreme Weather Event in 2021.	Rulemaking 20-11-003 (Filed November 19, 2020)

PREPARED REPLY TESTIMONY OF THE CALIFORNIA SOLAR & STORAGE ASSOCIATION

Pursuant to the Assigned Commissioner's Amended Scoping Memo and Ruling for Phase 2 issued in this proceeding on August 10, 2021, CALSSA presents this reply testimony. This testimony sets forth responses to parties' direct testimony and resulting clarifications and refinements of the proposal submitted in CALSSA's direct testimony. This testimony addresses two topics: the need to minimize existing obstacles to getting battery storage capacity online in a timely manner so that storage resources can be available for the summer 2022 season, and proposed modifications to the emergency load reduction program (ELRP), as proposed in the Energy Division Staff Concept Paper (Staff Concept Paper) issued on August 16, 2021, and in other parties' direct testimony.

I. REDUCING BARRIERS TO BATTERY INSTALLATION

Sunrun, Inc., submitted testimony proposing that the Commission address, in this docket, a current and very real barrier to residential customers adopting storage: barriers that delay and interfere with battery installations. Often, the installation of storage requires a main panel upgrade (MPU) to the customer's utility panel. The barrier described in Sunrun's testimony is that, under current policy, installations are slowed by work that must be done by the utility, leading to long delays for many customers. MPUs can often be avoided with meter socket adapters (MSAs) at lower cost, and such technology can be provided by third parties.

To address these issues, Sunrun recommended that the Commission do all of the following: (1) establish clear time limits and streamlined processes for utilities to coordinate main panel upgrades—specifically meter spots and service disconnection and reconnection—to make it easier for customers to adopt storage, and allow third parties to remove and replace

meters; (2) allow third parties to install MSAs where appropriate, including a reasonable and streamlined device approval process; and (3) reform utility supply side connection MSA programs to achieve acceptable cycle times, costs, and applicability if third-party installation of supply side connection MSAs is not feasible.[1]

CALSSA strongly supports Sunrun's recommendations, as the barriers they describe are experienced by our member companies. CALSSA surveyed member contractors in June 2021 to estimate the average cost of main panel upgrades and the percentage of solar installations for which they are necessary in California. We received responses from 62 residential contractors. Collectively they report that 28% of solar installations require a main panel upgrade. If the survey had focused on storage systems, the percentage of systems requiring a MPU would have been even higher. The average cost of a main panel upgrade was determined to be $3,312.

In addition to main panel upgrades, deploying storage involves other extensive costs that can be avoided with MSAs. These balance of system costs, encompassing the labor, wiring, conduit, and other hardware needed to deploy the system, can represent a significant portion of overall costs. This is especially the case for storage deployments designed to provide whole home backup, one of the key use cases that motivate residential customers to purchase a battery storage system that can also be used for grid support. When extensive upgrades are required, the ability to intercept the household's load is made more challenging because the electrical connection between the utility meter and the home load panel is part of a factory certified assembly. Rewiring this combination of meter socket and service panel often voids the manufacturer's equipment certification. Therefore, contractors are typically forced to either fully replace the main panel or extend each individual home circuit from the main service panel to a new subpanel. The need to perform this rewiring dramatically increases project costs as well as project complexity.

Streamlining the utility portions of the main panel upgrade scope, and enabling third parties to perform additional aspects of the work, will reduce the barriers to installing energy storage. However, a different approach is needed to eliminate these barriers and enable rapid adoption of energy storage in California.

Innovative technologies have been or are being developed that can address this by leveraging the utility meter socket to create a disconnection point between the utility meter and

[1] Sunrun, Inc. Direct Testimony at 1-12 (Sept. 1, 2021).

the customer's loads. For example, Tesla has developed the Tesla Backup Switch, which does exactly this. Devices like this currently are categorically prohibited by all three IOUs via their electrical service requirements, notwithstanding whether those devices are certified to all relevant nationally recognized standards. Utilities have engaged in discussions to accept MSA solutions, but have dragged out those discussions for more than a year. We further note that the Commission has taken action in the microgrid proceeding to address this, by directing the IOUs to establish a standing process by which such solutions can be systematically evaluated and approved.[2] However, thus far the IOU filings in this regard have been fraught with issues and challenges that appear likely to subject prospective technologies to a highly subjective evaluative framework and the specter of conditions that seem likely to be non-starters, like requiring utility ownership and control of these solutions.[3]

CALSSA implores the Commission to take near term action to expedite access to these technologies and push the utilities to allow their use in circumstances where the technologies have been certified and listed by a Nationally Recognized Testing Laboratory. Enabling solutions like these can serve to expand access and scale deployments that can be used to support the grid.

II. MODIFICATIONS TO THE ELRP PROGRAM

CALSSA's direct testimony presented proposed modifications to the Emergency Load Reduction Program (ELRP) intended to increase customer participation in ELRP and to facilitate greater dispatch of energy from behind-the-meter (BTM) storage and smart devices by promoting the use of virtual power plants (VPPs), which can further ELRP's goals of reducing peak and net peak demand. CALSSA's goal is to offer a pathway to enroll as many customers as possible in an emergency reliability program and ensure maximum response from those customers once enrolled. Enabling participation by aggregators of residential energy storage systems can greatly increase both the level and the certainty of response to emergency reliability events, compared with relying on voluntary customer behavior that does not maximize or systematize battery performance during those events.

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[2] D.21-01-018, Ordering Paragraph 9.

[3] *See* "Tesla, Inc.'s Protest to Pacific Gas and Electric Advice Letter 6153-E-A, Southern California Edison Advice Letter 4462-E-A and San Diego Gas and Electric Advice Letter 3734-E-A."

Other parties' direct testimony presented other proposals for ways to modify ELRP and raised various issues regarding the program. In this reply testimony, CALSSA responds to various issues, clarifies its proposal, and presents an alternative plan to pursue an energy-only option for summer 2022 and later development of the full program.

As a foundation for our proposal, CALSSA supports the Staff Concept Paper's proposal for all residential customers not already participating in an existing supply-side demand response (DR) program to be automatically enrolled and participate in ELRP on an individual basis.[4] They should be paid $1/kWh for incremental load reduction during Flex Alert events.[5]

Sierra Club agrees with the Staff Concept Paper's proposal to enroll all residential customers in ELRP by default (automatic enrollment). Their witness believes that automatic enrollment would be optimal because it provides opportunities for customers without burdens or commitments.[6] By contrast, CPower and Enel X North America, Inc. (the Joint DR Parties) disagree with the proposal for automatic enrollment, raising concerns that it could have significant competitive implications and could pose challenges for program administration.[7] These two parties' comments reveal a tension between what may work well from an individual residential customer's perspective but cause various complications from the perspective of a third-party aggregator or a program administrator.

CALSSA believes that the optimal way to address this tension is by designing a program that uses automatic enrollment as a means to enlist a broad base of residential customers into ELRP, while recognizing that this step will not in itself ensure customers participate meaningfully in reducing peak and net peak demand. Many residential customers enrolled into the program by default will not be aware of their participation, and they will be compensated for unintentional behaviors that reduce demand. Combining this with expanded dispatch through Flex Alerts creates a risk of substantial compensation for such unintentional behavior.

For this reason, CALSSA is not convinced that the Staff Concept Paper's proposal for residential customers on its own will achieve the Commission's goals of reducing peak and net

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4 Staff Concept Paper at 4-5.
5 *Id.* at 5.
6 Sierra Club Direct Testimony of Sahm White at 24:11-16 (Sept. 1, 2021).
7 Joint DR Parties Direct Testimony at 26:14-21 (Sept. 1, 2021).

peak demand. CALSSA proposes an opt-in alternative to increase customers' intentional participation by drawing on third-party aggregator VPPs, which we have identified as ELRP Group C.

A. CALSSA's Group C Proposal with Aggregator Selection of Capacity or Energy Payment

CALSSA's proposal is a simple, straightforward way to increase enrollment in emergency response programs by solar plus storage customers, and to maximize the participation of those customers in emergency events. Our proposal builds off the existing ELRP program and the suggestions made in the Staff Concept Paper to create a program that would enable aggregators to enroll residential customers with battery storage into VPPs, and that appropriately incentivizes aggregators and customers to provide the maximum response during emergency events.

CALSSA proposes that the Commission create a program that customers and aggregators can opt into that enables aggregators to achieve greater performance with energy storage than customers would be able to achieve with behavioral changes. To incentivize aggregators to participate and reach these goals, the program should include a trigger for a greater number of hours of dispatch, based on CAISO wholesale market prices, and should include an option for a capacity payment in lieu of payment for energy.

Enrollment Process

As discussed previously, CALSSA supports individual residential customers being automatically enrolled in ELRP with $1/kWh compensation for demand reduction, but believes that should be a starting point for program modifications, rather than an end point.

OhmConnect's direct testimony discusses reasons why the staff proposal for residential customers being enrolled automatically into ELRP may not provide significant load reduction.[8] OhmConnect asserts that if ELRP is successful, it will not only incentivize customers to respond during emergency conditions, but will also lead to customer enrollment in other programs with higher impact.[9] CALSSA agrees generally with this perspective, but believes that ELRP itself provides the opportunity for customer enrollment in programs that can achieve greater

[8] OhmConnect Direct Testimony at 3:9-11 (Sept. 1, 2021).
[9] *Id.* at 3:11-14.

participation in peak and net peak demand reduction. CALSSA's proposal to add Group C for virtual power plants is designed to achieve this end.[10]

In CALSSA's proposal, residential customers have the option to sign up with an ELRP aggregator that helps them achieve maximum performance during ELRP events. Customers need to proactively enroll in Group C. To enable widespread participation, it is essential that the customer is able to complete the application process entirely online, as is current practice for nearly all types of commerce. It is also essential that the aggregator be able to initiate the application process. This ensures that customers have an existing relationship with the aggregator. If customers were able to choose to join an aggregation through a drop-down list in their utility account, for example, there would likely be some who attempt to opt into an aggregation that they cannot participate in because they do not have an existing relationship, such as having a battery managed by that company.

Successful enrollment without such pitfalls can be achieved with an online application management and verification service such as Docusign. Aggregators can initiate that application. Utilities can choose to receive the applications directly from Docusign, but CALSSA presumes they would rather receive them from aggregators in a batch. That batch of applications will include an audit trail for each application that can be used in a spot audit process to verify its authenticity. There should be a standard application form, and also a process for approving alternative versions of the form if aggregators have additional conditions and warranties they wish to include for their customers.

CEJA raises a concern about persistent difficulties in moving customers between programs, with delays and cumbersome processes creating barriers to enrollment in alternative programs. CEJA proposes that enrollment in an alternative program should entail automatic disenrollment from a prior program, in a one-click process.[11] CALSSA recognizes the potential for such difficulties, and offers the following refinement to the proposal presented in its direct testimony.

The utilities need to create a process for quickly determining which of the customers in the batch of applications they receive from an aggregator are not eligible because they are already enrolled in a demand response program. If a demand response provider has done the

[10] CALSSA Direct Testimony at 4:5-5:19 (Sept. 1, 2021).
[11] CEJA Direct Testimony at 4:10-26 (Sept. 1, 2021).

work of enrolling that customer in their aggregation, an ELRP aggregator should not be allowed to claim that customer without an additional communication from the customer.

The utilities will communicate back to the aggregator within one week with an approved list of customers. The aggregator can choose whether to follow up with those that are not approved to ask if they want to disenroll from their current demand response aggregation in order to opt into an ELRP aggregation.

For customers that are enrolled in a demand response program, a separate form is needed to disenroll from that program and enroll in an ELRP aggregation. This form will make clear to the customer that they are enrolled in another program and want to disenroll from it in order to be enrolled in an ELRP aggregation.

The Commission should order the utilities to hold one meet and confer session with relevant stakeholders after the final decision and before filing the implementing advice letter. This session will be an opportunity to provide input on a standard agreement, a process for approving alternative versions of the agreement, and the mechanism for submitting a batch of applications as a proposed ELRP aggregation.

Dual Participation

In direct testimony, CALSSA proposed that rules prohibiting dual participation should not be included in the Group C proposal.[12] Sunrun's direct testimony spoke to the issue of dual participation in the context of the staff proposal to prohibit residential customers from dual participating in a capacity program and ELRP.[13] Sunrun's witness observed that "absent a capacity component to ELRP," the reasoning for this staff proposal was unclear, given that ELRP currently allows for dual participation by other customers.[14]

CALSSA has proposed a capacity option for aggregators in Group C, as well as an energy-only option.[15] Originally, CALSSA did not distinguish between these options in terms of dual participation rules. In response to Sunrun's reasoning, CALSSA now refines its proposal to provide for different treatments under these two options:

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12 CALSSA Direct Testimony at 13:12-15.
13 Sunrun Direct Testimony at 18:3-6.
14 *Id.* at 18:6-10.
15 CALSSA Direct Testimony at 8:15-9:14.

- Group C customers that opt into an ELRP aggregation that receives a capacity payment should not be allowed to be also enrolled in a market-integrated demand response program.
- Customers that opt into an ELRP aggregation that only receives energy payments may also be enrolled in a demand response program. As described below, customers participating in energy-only aggregations will receive compensation within ELRP only for those hours that are triggered by emergency events, and will be eligible to participate in demand response programs in hours that are not emergency events within ELRP.

Program Dispatch Trigger and Performance Requirements

CAISO Flex Alerts should be added as a dispatch trigger, in accordance with the Staff Concept Paper, which proposes this trigger for individual customers automatically enrolled into ELRP. Flex Alerts are an appropriate trigger for Group C aggregator programs as well, as they signal conditions of grid stress in which demand reduction is needed to maintain reliability. This is a refinement and change to CALSSA's direct testimony.[16]

As described in direct testimony, ELRP participation by individual customers in an aggregation should be voluntary and not dependent on the performance of the larger VPP aggregation.

For aggregators that are receiving a capacity payment, the program should require them to dispatch their assets more often than they would under emergency conditions only. Customers will be dispatched for roughly 50 hours per year based on CAISO day-ahead Locational Marginal Prices (LMP), in addition to all CAISO AWE and Flex Alerts. Each year, a price trigger will be selected based on the wholesale price that would result in 50 hours of dispatch using prices from the previous three years, as explained in CALSSA direct testimony.[17]

For aggregators that are not receiving a capacity payment, they should have a dispatch obligation for emergency hours, including AWE events and Flex Alerts. In CALSSA's direct testimony, we explained that the energy-only option would entail a commitment to a minimum level of performance on the part of the aggregator.[18] As a refinement to the proposal, we propose

[16] *See id.* at 5:21-24.
[17] *Id.* at 6:3-18.
[18] *Id.* at 8:29-9:9.

to include Flex Alert events so that those hours also require this commitment. To clarify the proposal, participation is voluntary in price-triggered hours that are not emergency hours.

For aggregators that opt for an energy payment, CALSSA recommends that ELRP compensation be bounded by 50% to 200% of the pre-nominated energy dispatch commitment, under the same methodology currently used for Group A customers.[19] Non-emergency price-signaled dispatches would not be subject to a commitment.

Southern California Edison refers to ELRP as a "non-penalty, pay-for-performance program" and does not support the Staff Concept Paper's concept of increasing compensation for customers who commit to performing at a certain level.[20] CALSSA urges the Commission to take a different perspective. Emergency reliability is a vital statewide concern that warrants a bold new program direction. The program will deliver more results with more certainty if aggregators are strongly integrated. CALSSA supports penalties for non-performance for aggregators that receive capacity payments.

Compensation Structure

Customers who participate in aggregator programs through Group C should be compensated for incremental load reduction at $1/kWh, the same rate as individual customers who participate in ELRP by default without aggregator assistance. This compensation should be paid for response during emergency events, including Flex Alerts. Aggregators will enable these customers to participate at a greater level and receive commensurately greater compensation. Customers on an interconnection agreement that does not allow for export would simply be paid for load reduction resulting from their battery discharge.

Advanced Energy Economy rightly observes that the staff proposal does not spell out how third-party aggregators would be compensated for ELRP performance, and suggests that this issue should be addressed early in development of the program.[21] CALSSA shares this concern and believes that the Commission should enable aggregators to play a key role in the new residential portion of ELRP.

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19 *Id.* at 8:26-9:9.

20 Southern California Edison Direct Testimony at 38:5-7 (Sept. 1, 2021).

21 Advanced Energy Economy Direct Testimony at 5:7-11 (Sept. 1, 2021).

For aggregator compensation, as explained in direct testimony, CALSSA proposes that the Group C program include two payment methods from which aggregators may choose, to allow for testing both methods through the pilot ELRP program.[22]

Under the capacity payment option, as described in CALSSA's direct testimony, the aggregator would receive a monthly payment for the capacity it commits to providing through the program. CALSSA originally proposed that the capacity payment be set equal to the net Cost of New Entry (CONE) for utility-scale 4-hour battery storage used in the most recent iteration of the Avoided Cost Calculator or Integrated Resource Planning production cost model.[23] Another option available to the program is the Capacity Procurement Mechanism price, which is set by CAISO each year as an available mechanism for emergency procurement. Both of these options are already set outside of ELRP and would be easy to use within ELRP.

Under the energy payment option, aggregators would be paid a higher amount for emergency dispatches and a lower amount for price-triggered dispatches that are not during emergency hours. Emergency hours would be paid $1/kWh, for a total payment to Group C of $2/kWh. This is consistent with the Staff Concept Paper's proposal to increase compensation rates for some ELRP groups to increase participation, with a commitment to providing a certain level of load reduction performance.[24] Non-emergency hours would be paid at the Locational Marginal Prices that apply during the dispatch times. Aggregators would never receive compensation through both programs for an overlapping event hour.[25]

Table 1 below summarizes the energy compensation for performance above a baseline that would apply for customers and aggregators under different triggering conditions.

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22 CALSSA Direct Testimony at 8:8-16.
23 *Id.* at 8:17-24.
24 Staff Concept Paper at 3.
25 CALSSA Direct Testimony at 10:13-19.

Table 1. Energy Payments for Individual Residential Customers and for Group C Customers and Aggregators

Trigger	Default ELRP Customer (not Group C VPPs)	Group C Customer (Enrolled in Aggregator VPP)	Group C Aggregator—Energy Payment Option	Group C Aggregator—Capacity Payment Option
Emergency hour that is a price-triggered hour	$1/kWh	$1/kWh	$1/kWh	No energy payment
Emergency hour that is not a price-triggered hour	$1/kWh	$1/kWh	$1/kWh	No energy payment
Price-triggered hour that is not an emergency hour	$0	$0	LMP	No energy payment

Measurement/Settlement

For individual customers participating in Group C aggregations, performance is settled at the utility meter, with energy exported to the grid allowed to count as load reduction, similar to individual residential customers enrolled automatically in ELRP and not participating in an aggregation.

As set forth in CALSSA's direct testimony, aggregators should have the option to settle with the utility at the battery inverter, based on the dispatch of energy from the battery (irrespective of home load), using a baseline that considers only battery discharge (and not home load) on non-event days. This option is offered in recognition that storage device dispatch is separate from customer load reduction.[26] From a general standpoint this results in the customer receiving compensation for behavioral change plus performance that is part of an aggregation, while the aggregator is compensated for the performance of its aggregation but not for the behavioral changes that customers undertake outside of battery discharging.

[26] *Id.* at 7:9-31, 11:8-13.

B. Alternate Energy-Only Program for 2022

If the Commission chooses not to create a capacity payment structure in time for the 2022 program year, it can alternatively implement an energy-only version first, with a capacity payment version to be implemented for the 2023 program year. All of the program details described above, except those that are specific to capacity payments, are relevant to an energy-only program. Below we highlight some features but do not reiterate details.

Enrollment

Since the individual customer will have already been enrolled in ELRP and is paid directly by the utility, and the aggregator's role is simply to help the customer achieve maximum response, the individual customer need not take any additional step to enroll in an ELRP aggregation beyond executing an agreement with the aggregator. Once the agreement has been executed between the customer and the aggregator, the aggregator provides the customer agreements to the utility to "register" in Group C and nominate an amount of load drop/battery discharge.

Compensation Structure

The compensation structure in an energy-only program would be consistent with the relevant columns in Table 1. During AWE or Flex Alert events, customers are paid $1/kWh for all load reduction plus battery storage that is exported to the grid.

Aggregators that enroll residential storage customers in a virtual power plant and commit to a minimum aggregate level of capacity are separately paid an additional $1/kWh, for a total payment to Group C of $2/kWh. The Commission can expect aggregators to share some of this revenue with customers in order to get their participation, just as shared revenue happens currently in demand response programs.

Performance Requirements

For the energy-only option of CALSSA's proposal, ELRP compensation to the aggregator is bounded by 50% to 200% of the pre-nominated energy dispatch commitment, under the same methodology currently used for Group A customers. There is no lower-level compensation for non-emergency events in this emergency-only alternative.

Settlement

As stated above, aggregators have the option to settle with the utility at the battery inverter, based on the dispatch of energy from the battery, without consideration of the

customer's load reduction. The baseline would consider only battery discharge on non-event days, without factoring in home load. Individual customer performance is settled at the utility meter, with energy exported to the grid allowed to count as load reduction, similar to ELRP customers who are not participating in an aggregation.

This concludes CALSSA's testimony.

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VERIFICATION OF FACTS IN PREPARED REPLY TESTIMONY OF THE CALIFORNIA SOLAR & STORAGE ASSOCIATION

The Prepared Reply Testimony of the California Solar & Storage Association (Testimony), filed September 10, 2021, was prepared under my supervision. The facts contained in the Testimony are true and correct to the best of my knowledge, except as to matters that are stated on information and belief, and as to those matters, I believe them to be true. Any opinions expressed in the Testimony reflect my best professional judgment.

I understand this declaration is made under penalty of perjury.

/s/ *Brad Heavner*

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