Submit comment on Uplift & DEB, State-of-Charge Management, and Mixed-Fuel and Distribution-Level Resources Meeting on Sep 29, 2025

Initiative: Storage design and modeling

1. Please provide a summary of your organization's general comments on and materials shared on Sep 29th meeting

The California Energy Storage Alliance (CESA) appreciates the opportunity to comment on the September 29, 2025, Storage Design and Modeling working group.

2. Provide your organization's comments regarding the Day-Ahead BCR for Storage

CESA does not support eliminating day-ahead bid cost recovery (BCR) for storage as an independent market design change. CESA continues to support a holistic review of a necessary make-whole payment design when shortfalls are caused by CAISO market limitations and storage operator actions. CAISO has highlighted that "forced" buy-backs and sell-backs for day-ahead energy schedules in the real-time market are the primary drivers of storage BCR. Thus, there is an interaction between the two markets when determining the appropriateness of a make-whole payment. CESA believes this initiative should focus on a real-time make-whole payment for storage leveraging the conceptual framework CESA provided earlier.

The key principle regarding a new storage real-time make whole payment design is whether the shortfall was caused by the storage operator or caused by CAISO market shortcomings. CESA's conceptual framework is to eliminate forced buyback (sellback) hours (from highest to lowest) from the make-whole settlement for each hour the storage operator is dispatched using energy bids inconsistent with real-time conditions. At the September 29 working group, CAISO proposed an accuracy threshold for the day-ahead initial state of charge (ISOC) bid parameter to be eligible for real-time BCR or any successor paradigm. A similar approach could be applied to the ISOC. If the ISOC used in the day-ahead market were lower by the amount the resource could be charged in a given operating hour, then the highest forced buyback hourly shortfall would be excluded from the real-time make whole calculation. CESA looks forward to CAISO developing a proposal consistent with the conceptual framework.

3. Provide your organization's comments regarding the Performance of CAISO Storage Resources Under Multi-Interval Optimization

CESA appreciates the data provided by the CAISO regarding the accuracy of the real-time multi-interval optimization. The current BCR design developed for thermal resources considers start-up costs, minimum load costs, and energy bid costs when calculating an interval's shortfall. Energy bid cost shortfalls are not the primary driver of real-time BCR for thermal resources but are the single

driver of the need for a real-time make whole payment for storage. Out-of-merit dispatches in approximately 10% of intervals seem to justify a real-time make-whole payment for storage. Currently, the out-of-merit dispatches could result in a real-time BCR payment for storage resources. During the working group, CESA requested the CAISO provide data on how often other resource types are dispatched out-of-merit based on the resource's energy bid.

While CAISO summarized that RTD binding intervals are comparable to advisory interval prices, there are some outliers observed during the morning peak. CAISO also stated that schedules between binding and advisory intervals are generally comparable. Outliers are why a make-whole payment is necessary. If the outlier causes a storage resource to not cover its costs over the day, the storage resource deserves a real-time make-whole payment.

CAISO's summary of the impact of out-of-merit dispatch understated the potential impact on a storage resource and the need for a real-time make-whole payment. While storage resources receive out-of-merit dispatches in less than 10% of intervals, it seems very high and could be materially higher than other resource types. Likewise, while ~84% of storage resources have less than 10% of out-of-merit dispatches, that means ~16% have greater than 10% out-of-merit dispatches. Given the level of out-of-merit dispatches for some resources, a real-time make whole payment is needed. CAISO should also seek to understand the root causes of the out-of-merit dispatches to determine if market design enhancements are necessary.

Lastly, the CAISO summarized that a higher frequency of out-of-merit dispatches was observed during the summer months and in afternoons (HE14-17). This is potentially concerning if storage resources are not being dispatched consistent with the resource's discharge and charging bids just prior to the evening net peak. Given the potential reliability issues this could create, CAISO must determine the root causes behind this observation.

4. Is irradiance-based high sustainable limit (iHSL) implementable? What challenges do you foresee?

In general, CESA supports reasonable requests by CAISO to enhance telemetry and other resource information that will improve the CAISO dispatch of resources. During the working group, CAISO mentioned that the iHSL proposal would apply to all solar resources. If this is the case, CAISO should discuss this change with a broader stakeholder group than those in this initiative focused on improving the hybrid model.

5. What advantages or disadvantages do you see if the irradiance-based high sustainable limit (iHSL) formulation were a requirement for solar resources?

No additional comments.

6. Provide your organization's comments regarding the Outage Reporting for Distribution-Level Charging Constraints

CESA does not support using a nature of work that is not exempt from the resource adequacy availability incentive mechanism (RAAIM) for WDAT storage resource subject to distribution charging constraints. CESA supports including the charging restrictions placed on WDAT storage resources in the Master File. If these operational constraints were modeled in the optimization, there would be no exposure to RAAIM penalties. Until the operational constraints are modeled, WDAT storage resources should continue to use an outage nature of work that exempt from RAAIM penalties.

First, it is illogical to subject storage resources to RAAIM penalties if the CAISO's ultimate goal is to introduce new Master File parameters to adequately reflect distribution-level charging restrictions in the market optimization. The CAISO is unjustified in applying a RAAIM penalty for a near-term solution when once the operational characteristic is included in the market model there would be no outage subject to a RAAIM penalty.

Second, if the CAISO has issues with the calculation of qualifying capacity (QC) developed by the CPUC, CAISO should engage in a CPUC process and not inappropriately apply RAAIM penalties the purpose of which is NOT to validate QC calculations.

CAISO attempted to justify its position by arguing that WDAT storage resources made this decision by not choosing Firm charging service. This was not a viable choice for resources interconnecting with SCE. SCE requires that resources fund all upgrades to resolve all N-1 contingencies, which is an unreasonable expectation of a project developer. In addition, the static charging tables are intended to be an interim solution put in place until SCE can deploy a sub-transmission level constraint management system (CMS). SCE currently estimates that this system will be completed in Q2 of 2027. CESA notes that the CAISO's security constrained economic dispatch (SCED) enforces N-1 contingencies in the market and does not penalize storage resource not dispatched to charge because a constraint is binding. This further justifies using a RAAIM exempt nature of work during this interim period.

During the working group, a stakeholder asked CAISO what nature of work should be used for charging constraints. CAISO was unable to or unwilling to answer this question during the working group. If CAISO does not believe that "transmission induced" is the correct nature of work, should the resource use the "technical limitations not in the market model" nature of work? CAISO should clarify publicly for all stakeholders how to reflect distribution charging constraints since the CAISO currently is unable to model these operational limitations and not subject to RAAIM penalties.

7. Provide your organization's comments regarding the SOC Management Topics

CESA reiterates that complete documentation of the storage modeling constraints in the integrated forward market, residual unit commitment process, fifteen-minute market, and real-time dispatch are needed to perform a holistic review of storage participation in the CAISO markets. CESA first raised the value of this in comments provided January 8, 2025, and heard agreement with the value proposition. However, after 10 months, what should have been the starting point for effective and efficient improvements to conditions giving rise to the need for real-time make whole payments, the documentation has still not been developed.

CESA appreciates briefly discussing the changes to the Day-Ahead Market Enhancements business requirements specification regarding the envelope equations in the working group. However, CESA is becoming increasingly concerned with the proliferation of attenuation factors and the impact to storage dispatch and overall price formation by distorting opportunity cost calculations. CAISO must closely monitor the inefficiencies caused by including attenuation factors based upon forecasted usage which will always be wrong. CAISO should also plan to review its findings with the Markets Surveillance Committee.

8. Provide your organization's comments regarding the PRR 1627 Changes

CESA appreciates the regular updates regarding the performance of FRU since the product was added to the state-of-charge constraints with attenuation factors. CAISO noted that there have been seven instances of negative FRU prices. This is concerning because it is further evidence that the SOC with attenuation factors is undermining price formation by incorrectly calculating opportunity

costs between charging/discharging energy and other products. CESA looks forward to additional discussion in the working group on the resolutions the CAISO is considering internally.

9. How much effort is required to configure or reconfigure HSL for a new vs existing resource?

No additional comments.

10. Are there alternative methods to calculate solar HSL that you recommend?

No additional comments.

11. Provide your organization's comments on the presentation offered by the Fluence Energy

CESA appreciated the presentation by Fluence Energy. The presentation highlighted the need for storage operators to consider the state of charge, state of balance, and state of health of the underline storage technology to optimize bidding and participation in the CAISO markets. CESA notes that the presentation highlights the willingness of storage operators to maximize the capabilities of their resource, if the CAISO rules create incentives to do so.

12. Provide your organization's comments on the presentation offered by the GridSME on behalf of Wellhead Power Services

CESA appreciated the presentation by GridSME on behalf of Wellhead Power Services. Wellhead has developed a resource combination of a gas turbine and energy storage located at the same point of interconnection using either hybrid market model. The proposal to use the higher of the variable fuel cost option or the storage default energy bid illustrates a point CESA highlighted in the *Price Formation Enhancements Rules for Bidding above the Soft Offer Cap.* In that initiative, CESA highlighted the need to correctly position storage in the bid stack to avoid dispatch inconsistent with real-time system conditions. The proposal outlined by Wellhead is aligned with CESA position how to improve default energy bids for storage.

13. Please provide any additional comments, feedback, or examples in the Sep 29th stakeholder meeting. You may upload examples or data using the "Attachments" field below.

No additional comments.