

Storage Design and Modeling

Draft Final Proposal on Default Energy Bids

November 25, 2026

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1. Executive Summary

In this paper, the California Independent System Operator (the ISO) presents proposals to modernize default energy bids as batteries grow in market share. Today, the ISO may replace a resource's bid with a previously agreed upon default energy bid meant to reflect the resource's cost of producing one additional unit of electricity. This process limits the ability of local market power to affect market outcomes. Batteries participate in the market as standalone assets and as components of hybrid resources. Batteries are limited by their stored energy, unlike conventional generation, making their costs complex to define because a battery must decide whether to produce energy now or preserve energy for later when it may be more valuable. As such, the default energy bid applicable to these assets must balance mitigation with recognizing the changing value of stored energy throughout the day.

For storage resources, the ISO proposes moving forward with a time-of-day approach that allows the default energy bid to better reflect how the value of stored energy changes over the operating day. The proposal includes a scaling mechanism that adjusts for significant differences between prices observed across market runs and a floor based on the gas price that serves as a backstop when other measures do not adequately capture changing real-time conditions. ISO analysis indicates that (1) scaling can reduce the likelihood that mitigation causes batteries to discharge before the highest-value hours and (2) the gas floor is expected to affect the default energy bid relatively infrequently but can provide protection when day-ahead and real-time price conditions materially diverge. In addition, the draft final proposal also includes a modification to the charging default energy bid calculation to account for the inefficiency inherent to storage resources, further minimizing the risks posed by charging side mitigation.

The ISO also refines how the time-of-day adjustment itself should work. The ISO does not propose reducing this adjustment below 1.0 later in the day because a battery's energy can retain value beyond the current operating day. At the same time, the ISO recognizes concerns that automatically applying the higher 1.4 adjustment during most hours of every day could overstate opportunity costs. The ISO therefore sees merit in further exploring a stakeholder proposal that would activate the higher adjustment only when market conditions indicate that stored energy has become materially scarcer than expected, potentially using differences between expected day-ahead and actual real-time battery state-of-charge as a trigger. If stakeholders do not support further development of this alternative, the ISO believes the framework included in this proposal provides a reasonable basis for moving forward.

For hybrid resources, which combine multiple technologies like storage and solar behind a single resource, the ISO proposes establishing a standardized default energy bid based on the costs of the technologies that make up the resource. Under the proposed "greater-of" approach, the ISO would use the highest applicable default energy bid value of qualifying components. For new resources, a component would need to represent at least 30% of the hybrid resource for its default energy bid value to be considered. The threshold is intended to prevent a relatively small component, such as a small battery paired with a much larger solar facility, from determining the default energy bid for the entire resource. In response to stakeholder concerns, the ISO proposes applying this 30% requirement prospectively rather than to existing hybrid resources.

2. Introduction

The ISO is continuing its work to enhance default energy bid methodologies for storage and hybrid resources as these resource types become increasingly important to the operation of the markets across the broader West. The existing default energy bid methodology has provided an important foundation for the application of market power mitigation to storage resources, but its reliance on information from prior market runs can result in values that may no longer reflect prevailing conditions in the market in which mitigation occurs. In addition, the continued growth of storage across an expanding market footprint creates a need for default energy bid methodologies that can be applied consistently to a broader set of resources and geographies.

In this context, the ISO's objective is to develop default energy bids that support effective market power mitigation while appropriately reflecting the marginal and opportunity costs faced by energy-limited resources. For storage, this requires recognizing that the opportunity cost of discharging is not static throughout the operating day. A default energy bid that does not adequately recognize these changing opportunity costs can affect the placement of storage in the bid stack when mitigation occurs and, in turn, may interfere with resources' ability to preserve state-of-charge for periods when their energy is most valuable.

These considerations have informed three guiding principles for the ISO's work on the storage default energy bid: (1) the methodology should reflect changing real-time opportunity costs, (2) be readily available to storage resources regardless of location, and (3) minimize the risks associated with charging-side mitigation. Together, these principles seek to ensure that the default energy bid remains an effective mitigation tool while better recognizing the operational characteristics of storage resources.

In the July 2026 straw proposal, the ISO evaluated both a static approach and a time-of-day approach for enhancing the storage default energy bid. The static approach emphasized simplicity and consistency by relying on a uniform methodology across the day. The time-of-day approach reflected changing opportunity costs throughout the day. The ISO concluded that the time-of-day approach offered the stronger foundation because it could both better recognize changing opportunity costs over the operating day while addressing the risk that inputs derived from earlier market runs become "stale." Most stakeholders supported continued development of this approach, leading the ISO to refine the methodology in the September 2026 revised straw proposal.

The September revised straw proposal incorporated several modifications informed by stakeholder feedback, including a time-of-day multiplier, a scaling mechanism intended to account for differences in prices across market runs, a gas floor that can provide additional protection when other components understate changing real-time conditions, and a reduction of the multiplier applied to the price-based opportunity cost component from 1.4 to 1.1. The proposal also incorporated a safeguard that would prevent the time-of-day multiplier from transitioning before 5pm (hour ending 18) in real time. Collectively, these changes sought to balance the risks of (1) understating opportunity costs and

prematurely exhausting state-of-charge against (2) the equally important need to avoid overstating competitive costs and weakening mitigation.

Stakeholder comments on the revised straw proposal demonstrated considerable convergence on the overall direction of the storage default energy bid enhancements. Most commenters (1) supported moving away from a static formulation and towards a methodology capable of better reflecting changing storage opportunity costs, (2) supported the reduction of the price-based opportunity cost multiplier from 1.4 to 1.1, and (3) emphasized the importance of advancing default energy bid enhancements in the near term. At the same time, stakeholders continued to raise important questions regarding the cumulative effect of the proposed adjustments and whether particular parts of the methodology could drive an overestimation of storage opportunity costs.

This draft final proposal responds to those concerns with additional analysis and further refinement of the proposed methodology. In particular, the paper evaluates the effects of the scaling step, examines the circumstances in which the gas floor would affect the resulting default energy bid, and considers the appropriate values and application of the time-of-day multiplier. The analysis generally supports retaining scaling as a mechanism for addressing stale values and retaining the gas floor as a narrowly applicable guardrail. The analysis also recognizes stakeholder concerns regarding the potential for a 1.4 time-of-day multiplier applied broadly across every trade date to overstate opportunity costs under some conditions. In addition, the draft final proposal also includes a modification to the charging default energy bid calculation to account for the inefficiency inherent to storage resources, further minimizing the risks posed by charging side mitigation.

Accordingly, the paper also considers whether application of the higher time-of-day multiplier could be made more responsive to actual market conditions. One alternative, raised through stakeholder comments, would dynamically trigger the higher multiplier when market conditions, such as a material divergence between expected day-ahead and observed real-time aggregate state-of-charge, indicate that stored energy has become scarcer than anticipated. Although such an approach could reduce the potential for overestimating opportunity costs and lessen reliance on fixed time-of-day parameters, important questions regarding the definition, geographic scope, and calibration of such a trigger would need to be resolved before adoption.

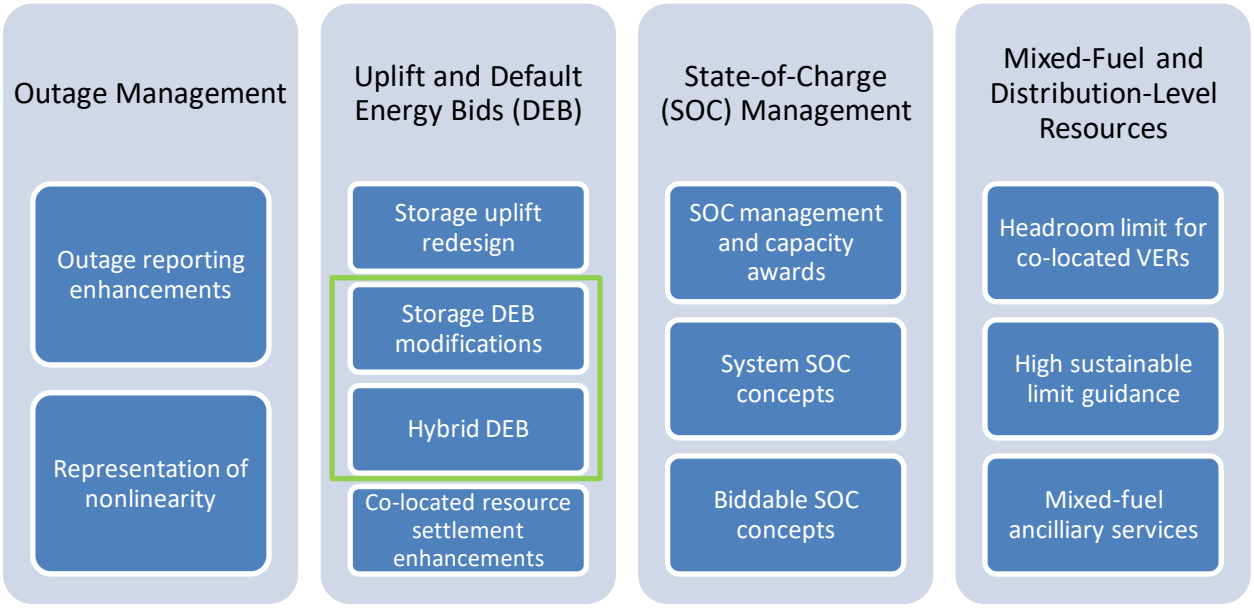
In parallel with these storage enhancements, the ISO continues to develop a standardized default energy bid methodology for hybrid resources. The proposal builds on the greater-of approach introduced in earlier papers, under which the hybrid resource would generally use the highest applicable default energy bid value among its qualifying underlying components. To ensure that a relatively small component cannot determine the default energy bid applicable to the entire hybrid resource, the ISO proposes pairing this approach with a 30% minimum share requirement, applied prospectively. The paper also responds to stakeholder feedback regarding treatment of existing hybrid resources and the interaction between mitigation, bidding, dynamic limits, and management of a hybrid resource's storage component.

Taken together, the proposals in this paper seek to establish more durable default energy bid methodologies for storage and hybrid resources as their participation in Western energy markets continues to evolve. For storage, the ISO seeks to improve the representation of changing opportunity costs while preserving effective mitigation and supporting state-of-charge management. For hybrid resources, the ISO seeks to establish a technology-neutral framework that recognizes the costs of the underlying components while ensuring that the resulting default energy bid remains representative of a meaningful portion of the resource. The following sections summarize stakeholder feedback, provide additional analysis and ISO responses, and describe the proposed path forward for each of these enhancements.

3. Stakeholder Process

To address elements related to energy storage participation, the ISO launched the Storage Design and Modeling initiative. Given the complexity, broad scope, and interrelated nature of some items, the ISO created four topic groups to facilitate parallel development, efficient stakeholder engagement, and phased resolution. Figure 1 shows these topics as grouped. The green boxes show topics discussed in this paper. Workstreams may span groupings as needed.

Figure 1. Topic Groups



This paper incorporates verbal feedback from initiative meetings, three rounds of written comments in response to the issue paper, straw proposal, and revised straw proposal, and ISO implementation assessments. Figure 2 shows the typical process for a stakeholder initiative. The default energy bid topics are in the “develop” stage.

Figure 2. Stakeholder Process Milestones



4. Storage Default Energy Bids

In the revised straw proposal, published September 2026, the ISO included the latest iteration of the problem statement on storage default energy bids, which read:

- The storage default energy bid's dependence on outputs from prior market runs creates challenges because:
  - Those values may be "stale" in the market where the default energy bid is used.
  - With an expanding footprint, some resources that are not part of the day-ahead market cannot readily leverage the storage default energy bid option.
- A static real-time storage default energy bid has the potential to over- or underestimate opportunity costs at different hours of the day.

The September 2026 revised straw proposal also detailed the latest iteration of the guiding principles, which read:

- The storage default energy bid should be designed in a way that allows for the reflection of changing real-time opportunity costs, ensuring the correct placement of storage within the bid stack, even under mitigation.
- The storage default energy bid should be calculated in a way that all storage resources, regardless of location, should be able to readily leverage a default energy bid option.
- The storage default energy bid should be designed in a way that minimizes the risks posed by charging-side mitigation.

In the July 2026 straw proposal, the ISO detailed two alternatives to enhance the energy storage default energy bid: the time-of-day approach and the static approach. In that paper, the ISO noted that the time-of-day approach's multiplier addresses the problem statements in alignment with the guiding principles by reflecting changing real-time opportunity costs. Moreover, by virtue of its scaling process, the time-of-day approach would address the challenges posed by using "stale" values. In addition, having a scaling step within the storage default energy bid methodology will ensure alignment with

already existing negotiated default energy bids, ensuring the correct placement of all storage assets within the bid stack in case of mitigation.

The July paper underscored that the time-of-day approach also offers a formulation that allows all storage resources, regardless of location, to readily leverage a default energy bid option with minimal differences. The only material difference between the formulations applicable to EDAM-only and WEIM-only resources relates to the price proxies used to estimate the price-based opportunity cost component. The ISO held that such differences are reasonable as they would allow the novel design to preserve the accuracy offered by the current storage default energy bid calculation. Finally, the time-of-day approach also minimizes the risks posed by charging-side mitigation by defining the charge default energy bid as the discharge default energy bid minus the variable operating costs.[1]

As a result, the ISO noted in the July 2026 paper that the time-of-day approach appeared to be the most effective at addressing the identified problem statements while remaining consistent with the guiding principles. Therefore, the ISO indicated an intention to continue developing this approach. In comments submitted in early August 2026, most stakeholders supported continued development of the time-of-day approach. American Clean Power-California (ACP-CA), the California Community Choice Association (CalCCA), the California Energy Storage Alliance (CESA), the CAISO Department of Market Monitoring (DMM), PacifiCorp, the California Public Utilities Commission's Public Advocates Office (Cal Advocates), San Diego Gas & Electric (SDG&E), Southern California Edison (SCE), and Terra-Gen all submitted comments favoring continued refinement of the time-of-day approach.

Given the overwhelming majority of stakeholders favored continued development of the time-of-day approach, the September 2026 revised straw proposal included a version of this concept that was altered in response to stakeholder feedback and incorporated elements from the alternative offered by DMM in their supplemental comments. The revised straw proposal is detailed in Box 1, below.

[1] This final feature is also present in the static approach.

Box 1. Revised Straw Proposal on the Time-of-Day Storage Default Energy Bid

$$DA\ Discharge\ DEB = Max(Variable\ Operations\ Cost * 1.1, PB_OC * 1.1, Gas\ Floor * 1.1)$$
$$DA\ Charge\ DEB = (DA\ Discharge\ DEB - Variable\ Operations\ Cost)$$

$$RT\ Discharge\ DEB = Max(Variable\ Operations\ Cost * 1.1, PB_OC * 1.1, Gas\ Floor * 1.1) * TOD\ Multiplier$$
$$RT\ Charge\ DEB = (RT\ Discharge\ DEB - Variable\ Operations\ Cost)$$

Where:

$Variable\ Operations\ Cost$: Represents cycling and other operational costs

PB_OC: Price-based Opportunity Cost

- In DA for EDAM, calculated by scaling the MPM outputs based on differences relative to DA LMPs
- In RT for EDAM, calculated by scaling DA LMPs based on differences relative to RT LMPs
- In RT for WEIM, calculated by scaling DGAP based on differences relative to RT LMPs

$$\text{the later of either (1) the earliest of the Nth highest priced day} - \text{ahead LMPs, or (2) hour ending 18 (only in real} - \text{time); a value of 1.0 afterwards.}$$

$Gas\ Floor$: 11,068 MMBtu/MWh * Fuel region gas price

To assess the differences between the different time-of-day alternatives, the ISO conducted analyses to compare them relative to each other and to the status quo.[2] The analyses presented in the September 2026 revised straw proposal indicated that the revised straw proposal consistently resulted in higher default energy bid values before the net peak relative to the current methodology, minimizing the likelihood of mitigation impeding state-of-charge management efforts. Moreover, by virtue of its time-of-day transition logic, the revised straw proposal provides a more dependable and consistent transition timing relative to the straw proposal. Overall, the ISO found that the revised straw proposal would effectively address the identified problem statements while remaining consistent with the guiding principles and responsive to stakeholder feedback.

[2] The analysis seeks to offer a comparison between different variants of the time-of-day approach and the current real-time default energy bid. The analysis looked at 240 battery storage assets from August 1, 2025, through July 31, 2026. Of the 240 battery assets, 176 had a four-hour duration; 54 had a duration under four hours, and 10 had a duration greater than four hours. Because today there is no standardized default energy bid methodology for WEIM-only resources and the analysis period only covered two months of EDAM operations, all assets considered were storage resources within the CAISO balancing authority area.

4.1. Stakeholder feedback on the Default Energy Bid Revised Straw Proposal

In comments submitted in early October 2026, most stakeholders broadly supported the direction of the revised straw proposal. Three areas of broad consensus could be identified among commenters.

First, most stakeholders agreed with the need to move away from a static default energy bid to a framework that can better recognize changing opportunity costs and address state-of-charge management challenges. In this context, most commenters supported the revised straw proposal's time-of-day framework because it better reflects changing storage opportunity costs and helps prevent premature discharge caused by mitigation. Supporters included CalCCA, CESA, DMM, SDG&E, SCE, Terra-Gen, the California Public Utilities Commission's Energy Division (CPUC ED), and others.

A second area of consensus was the reduction of the multiplier applicable to the price-based opportunity cost component within the time-of-day formulation. The straw proposal, published July 2026, included a 1.4 multiplier to address the calls for alignment between the hydro and storage default energy bids. At the time, the ISO noted that this value could be leveraged since it was derived from analysis that sought to limit dispatch of hydro resources to no more than 4 hours per day for 90% of days, a goal similar to the current assumption included in the default energy bid for storage resources.[3] Following the publication of the straw proposal, several stakeholders offered feedback noting that the use of a 1.4 multiplier was unwarranted, primarily noting the existence of other upward adjustments within the proposed time-of-day framework, most of which are not included in the hydro default energy bid.

As a result, in the revised straw proposal, the ISO proposed to use a 1.1 multiplier for the price-based opportunity cost component. This change would maintain the time-of-day approach's treatment of the price-based opportunity cost component largely aligned with today's storage default energy bid. Moreover, the change in the revised straw proposal was justified underscoring that the revised straw proposal contains several upward adjustments beyond this multiplier, making a higher value undesirable. In comments submitted early October 2026, most stakeholders supported the revised straw proposal's reduction of the price-based opportunity cost multiplier from 1.4 to 1.1, viewing it as a better balance between protecting storage opportunity costs and avoiding excessive mitigation relief. DMM, CalCCA, PG&E, SDG&E, SCE, Terra-Gen, CPUC Energy Division, and Cal Advocates were among the commenters supporting the modification. Finally, a third area of consensus among commenters relates to the importance of completing these enhancements in the near future. CalCCA, CESA, Cal Advocates, SDG&E, Terra-Gen, and WPTF generally supported the proposed prioritization and schedule.

While there were areas where broad consensus was achieved, three elements included in the revised straw proposal divided commenters. These included (1) the need for additional analysis on the combined impacts of the different multiplier and scaling modifications, (2) the inclusion of the gas floor

[3] The current storage default energy bid assumes that the storage resource performs one cycle of charging/discharging per day, and that the resource will charge during the least expensive continuous block of time during the day.

component, and (3) the definition of the time-of-day multiplier. The subsections below detail stakeholder feedback on these three areas and provide responses to each of these topics.

4.1.1. Comments on scaling

Overall, commenters expressed general support for the incorporation of a scaling step to address the "stale" value issue, subject to further development. No stakeholder expressly opposed the addition of a scaling process to the storage default energy bid. Notably, SCE, while generally supportive of the proposed scaling methodology, requested that the ISO clearly explain the basis for the methodology, its intended market outcome, and how the ISO would determine whether it is functioning as designed.

While stakeholders were universally supportive of this addition, some commenters requested further clarification on the proposed methodology and its effects. CESA and DMM requested more detail on how the scalar will be calculated. CESA questioned whether the proposed comparison of day-ahead prices vis-à-vis real-time prices addresses the "stale" price issue or merely reflects different price-formation rules between market runs.

Offering a different perspective, CalCCA, DMM, and CPUC ED emphasized the need to evaluate scaling together with the other elements that make up the time-of-day methodology: the time-of-day multiplier, the gas floor, and the 1.1 multiplier. DMM noted that a properly designed scalar methodology could potentially reduce the need for a separate multiplier applicable to the price-based opportunity cost component. Furthermore, DMM posited that a proper scalar methodology could also be a better alternative to the gas floor for addressing underestimated real-time prices. The ISO presents analysis to address these comments in the following subsection of this paper.

4.1.1.1. ISO response to comments on scaling

The goal of the scaling step is to mitigate the risks of the values used to set the price-based opportunity cost component being stale in the market where the default energy bid is used. To achieve this, the ISO has proposed to leverage the scaling methodology currently used for a significant share of the negotiated default energy bids currently applicable to WEIM-only storage resources. For each hour, the methodology compares day-ahead and real-time prices over the prior three days to develop an hourly scaling factor. The scaling factor is then applied to the applicable day-ahead price to better reflect recent market conditions. The reference prices used for scaling vary by market, as follows:

- In the day-ahead market for EDAM, day-ahead market power mitigation outputs are scaled based on differences relative to day-ahead LMPs
- In the real-time market for EDAM, day-ahead LMPs are scaled based on differences relative to real-time LMPs
- In the real-time market for WEIM, day-ahead DGAP prices are scaled based on differences relative to real-time LMPs
- For all of the above, a floor of one is applied so that the scaling adjustment does not reduce the underlying day-ahead price and real time price

To assess the impact of the scaling step, the ISO performed a series of analyses comparing four default energy bid methodologies: the current storage default energy bid, a version of the current methodology with the scaling step, the revised straw proposal without the scaling step, and the revised straw proposal with the scaling step. The goal of these analyses is twofold. First, these analyses will allow stakeholders to identify the relative value and impact of the inclusion of the scaling step by comparing each method to its variant that includes such a step. Second, by looking at the current default energy bid vis-à-vis the revised straw proposal with scaling, stakeholders will be able to see the cumulative effects of the scaling step and the time-of-day multiplier.

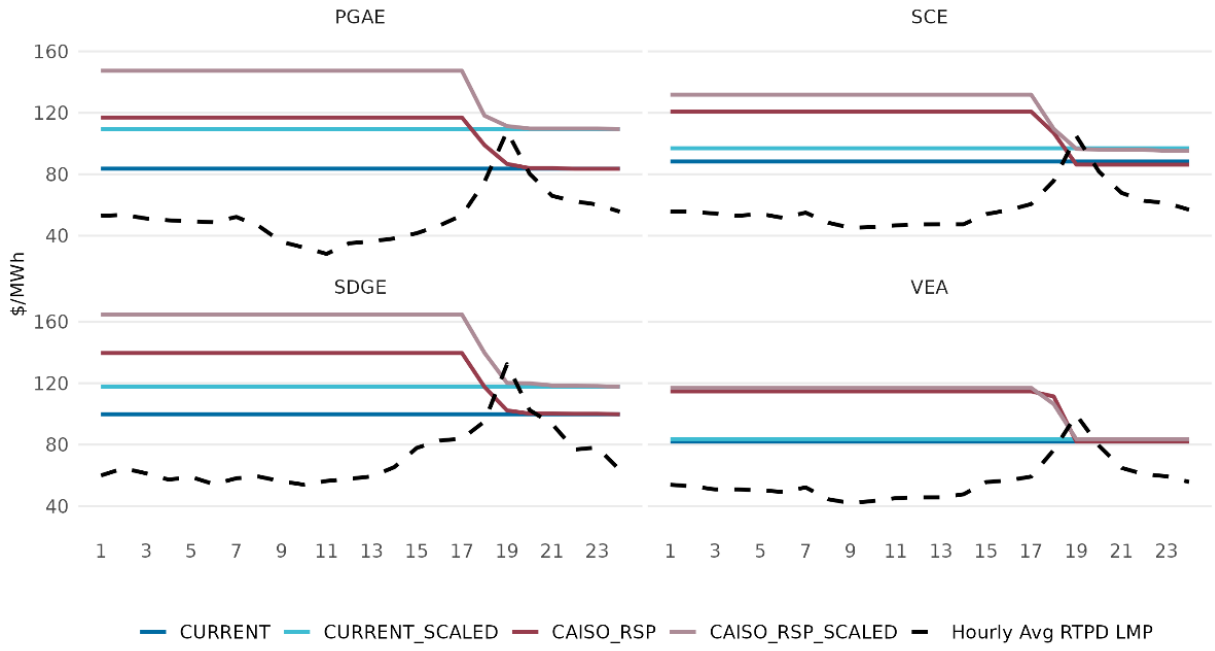
The analyses presented in this subsection focus on a timeframe that covers September 6 – 12, 2026. The ISO selected this timeframe as it represented a period with significant demand[4] during a recent heat wave event that could potentially inform systematic differences between the prices resulting from the day-ahead market and those that materialized in the real-time market. All assets considered were storage resources within the CAISO balancing authority area because today there is no standardized default energy bid methodology for WEIM-only resources and EDAM launched only recently.

In addition, the analyses presented below have a common set of assumptions. First, the LMPs used were derived from market results and therefore represent pricing outcomes that may have been impacted by market power mitigation. Second, the analyses provided assumed 100% mitigation such that resources were mitigated in every interval when the default energy bid value was below the LMP. As such, these are conservative analyses that do not only consider actual instances of mitigation. This is intended to provide a conservative bookend estimate of the impacts of the different variants relative to the status quo. Finally, and particularly relevant for the revenue efficiency analysis, the bids submitted by the assets analyzed were not considered to determine the optimal dispatch assumed for the revenue efficiency metric.

With these assumptions, the ISO first compared the current storage default energy bid (CURRENT), a version of the current methodology with the scaling step (CURRENT_SCALED), the revised straw proposal without the scaling step (CAISO_RSP), and the revised straw proposal with the scaling step (CAISO_RSP_SCALED) to the average 15-minute LMP by utility distribution company (UDC). This analysis shows that all default energy bid formulations with a scaling step result in a value greater than the alternatives without the scaling step, although the magnitude of the differences varies by UDC. This underscores the differentiated impact of the scaling step, which stems from the fact that the scaling is done at the LMP level and may have different dynamics in different geographies.

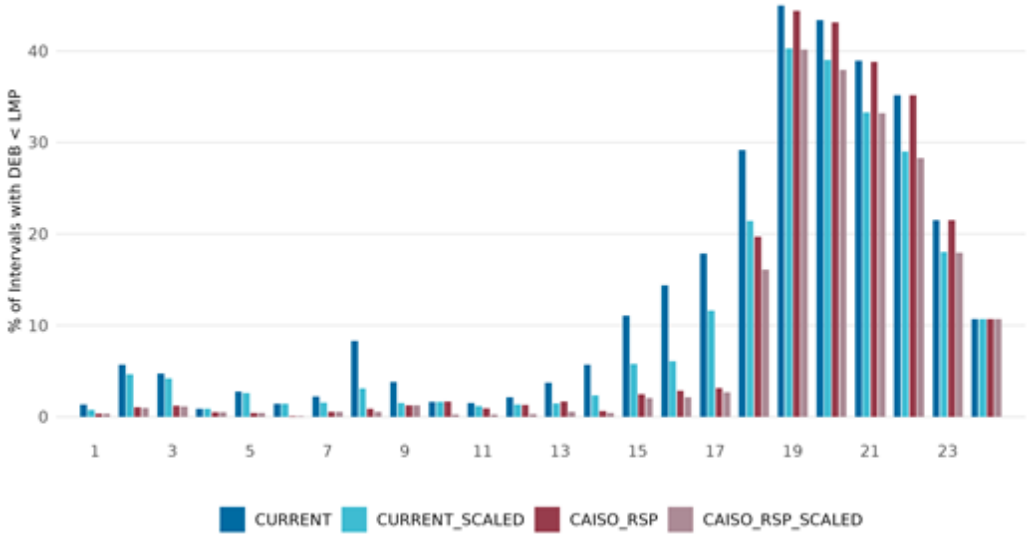
[4] This period included the second highest CAISO balancing authority area historical peak demand of 50,335 MW at 5:54pm on Sept. 9, 2026.

Figure 3. Comparison of Default Energy Bid Formulations and Average 15-Minute LMPs, by UDC



In addition, the analysis continues to show the efficacy of including a higher multiplier in the earlier hours of the day. As shown in the figure above, all time-of-day variations result in a default energy bid value that is significantly higher than the average 15-minute LMP during the midday hours, minimizing the risks mitigation during solar hours poses to state-of-charge management. To be clear, the figure above shows a comparison relative to the average LMP value. As such, the instances in which the default energy bid was lower than the LMP in midday hours are muted by looking at a large sample across a whole year. To further inform this discussion, the figure below shows the share of intervals where the default energy bid is lower than the average LMP, demonstrating that the current default energy bid (CURRENT) is the most likely to result in incremental discharge during solar hours.

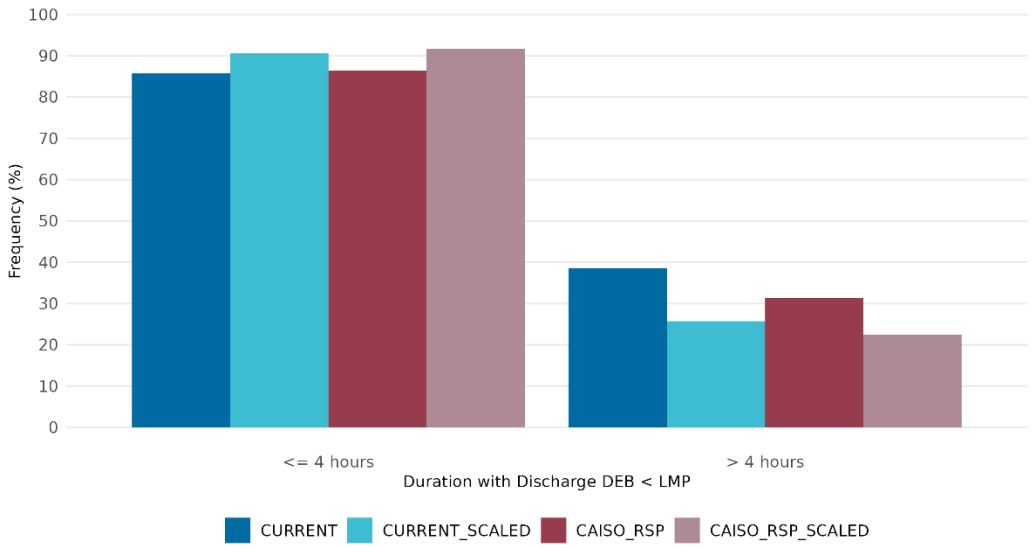
Figure 4. Percentage of Intervals where the Default Energy Bid Value is lower than the Average LMP.



Next, the ISO compared the number of hours for which the status quo and the different time-of-day alternatives produce a default energy bid lower than the average 15-minute LMP. This metric is helpful as it can provide some indication of the potential impact of the default energy bid formulation on the dispatch of batteries if it were driven solely by mitigation. Figure 5 shows histograms of the percentage of resource-days in which the default energy bid value is below the average 15-minute LMP for up to four hours and for more than four hours.

As shown in Figure 5, the revised straw proposal with the scaling step represents a significant enhancement relative to the current default energy bid for two reasons. First, the revised straw proposal with the scaling step results in a default energy bid that is lower than the average LMP for four hours or less at a greater rate than the current default energy bid. This is primarily due to the inclusion of the time-of-day multiplier, as shown in Figure 4 above. Second, and conversely, the revised straw proposal with a scaling step results in a default energy bid that is lower than the average LMP for more than four hours at a lower rate than both the current methodology and the revised straw proposal without scaling. Figure 4 supports the idea that this is primarily due to the inclusion of the scaling step, which continues to limit the likelihood of mitigation driving incremental dispatch in the earlier hours of the day.

Figure 5. Percentage of Resource-Days with a Default Energy Bid Value lower than the Average 15-Minute LMP.



In addition, the ISO estimated the revenue efficiency of the four default energy bid methodologies considered herein, by UDC. This metric tries to assess the economic efficiency of each default energy bid formulation based on the LMPs of the intervals during which storage resources would be discharged if mitigated. As such, this metric represents an idealized schedule that, for a four-hour resource, adds all the LMPs of the 16 highest-priced intervals under each default energy bid formulation. As noted previously, the analyses assumed 100% mitigation such that resources were mitigated in every interval when the default energy bid value was below the LMP. This total is then compared to a counterfactual that added all the LMPs of the 16 highest-priced intervals for that day. The resulting percentage represents the maximum potential revenues that each resource could earn when mitigated by each of the default energy bid formulations relative to a scenario without mitigation. As such, the revenue efficiency metric can be understood as a value that seeks to measure the balance between economic efficiency and an ability to mitigate the exercise of market power in order to preserve system reliability.

For this analysis, the ISO does not account for the bids submitted by resources. In order to produce both counterfactuals, the analysis assumes perfect foresight and simply dispatches the asset during the applicable number of highest-priced 15-minute intervals given the asset's duration. Similarly, resource awards are not accounted for, meaning that the resource is assumed to be generating at its full power capability for all intervals in which it is dispatched. This analysis only looked at storage resources in the CAISO balancing authority area and included batteries with discharge durations between one hour and eight hours, with the majority of assets being four-hour resources. The revenue efficiency results are detailed in Table 1.

Table 1. Revenue Efficiency Comparison

UDC	CURRENT	CAISO_SCALED	CAISO_RSP	CAISO_RSP_SCALED
PGAE	99.4	99.6	99.8	99.8
SCE	98.8	98.9	99.8	99.9
SDGE	94.2	96.4	98.1	98.4
VEA	100.0	100.0	100.0	100.0

Overall, the ISO views the scaling step as a valuable inclusion that, in conjunction with the time-of-day multiplier, minimizes the risk mitigation erodes state-of-charge management efforts. This can be seen by the results which underscore that the revised straw proposal with the scaling step results in (1) a default energy bid that is lower than the average LMP for four hours or less at a greater rate than the current default energy bid; and, (2) a default energy bid that is lower than the average LMP for more than four hours at a lower rate than the current methodology. These findings are directly related to this approach limiting the likelihood of mitigation driving incremental dispatch in the earlier hours of the day, prematurely exhausting state-of-charge.

4.1.2. Comments on the pertinence of the gas floor

The inclusion of the gas floor component within the revised straw proposal remains one of the most divisive elements of the proposed time-of-day default energy bid. Stakeholders supporting the inclusion of this component view the gas floor as a safeguard against underestimating storage opportunity costs when forecast prices fail to reflect actual market conditions, gas costs rise unexpectedly, or mitigation could otherwise result in premature discharge.

CESA supported including the gas floor in both day-ahead and real-time storage default energy bids, arguing that the gas floor helps appropriately position storage resources in the bid stack relative to other energy-limited resources when mitigated. CESA also noted that the gas floor reasonably reflects the risk faced by storage resources that are prematurely dispatched and must later buy back day-ahead positions from gas-fired resources at higher costs. As such, CESA views the gas floor as protection against situations where gas prices increase between the day-ahead and real-time markets.

WPTF offered very similar arguments to CESA in their support for retaining the gas floor. WPTF argued that the gas floor component provides an important backstop when price forecasts fail to capture emerging market conditions, such as during heat waves, gas-price spikes, and other circumstances where forecasted LMPs understate actual market conditions. As a result, WPTF noted that the inclusion of the gas floor is a useful safety net even if this component rarely sets the default energy bid.

NV Energy also supported retaining the gas floor component, underscoring that it can better reflect real-time opportunity costs in certain circumstances and arguing that the gas floor helps prevent mitigation from causing premature battery discharge, particularly for storage resources that cannot grid-charge. In addition, NV Energy also highlighted the importance of the inclusion of the gas floor in maintaining consistency in the treatment of energy-limited resources under mitigation.

PG&E similarly supported retaining the gas-price floor as part of the time-of-day paradigm, viewing it as a useful proxy when gas-fired generation is setting market prices or when gas prices are significantly above historical assumptions. In this context, PG&E argued that removing the gas floor could understate storage opportunity costs during stressed system conditions. As a result, PG&E recommended codifying the gas floor as a proxy or forecast of day-ahead prices so it can evolve if a better forecasting methodology becomes available. Lastly, PG&E supported reviewing the gas floor after implementation to evaluate whether it continues to appropriately balance mitigation, state-of-charge management, and market outcomes.

Taking a more nuanced approach, SDG&E generally supported retaining the gas floor, but requested additional analysis on (1) the magnitude of its impact when it binds, (2) seasonal patterns associated with gas-floor binding, and (3) whether the gas floor better reflects storage costs during periods of significant day-ahead versus real-time price divergence.

Conversely, stakeholders that oppose the inclusion of the gas floor argue that gas prices are not a direct component of storage marginal costs and that the inclusion of this component could overstate the default energy bid applicable to storage resources, thus weakening market-power mitigation, and potentially increasing costs.

CalCCA opposed the inclusion of the gas floor arguing that gas prices are not a direct determinant of storage marginal costs because the value of charging and discharging storage is already reflected in electricity prices, which inform the price-based opportunity cost component. As a result, CalCCA posited that the gas floor may unnecessarily increase default energy bids during periods of elevated gas prices while affecting only a limited number of intervals. Thus, CalCCA requested the removal of the gas floor.

SCE also raised significant concerns regarding the inclusion of the gas floor, arguing that its inclusion could cause the default energy bid to exceed competitive market prices when gas is not actually setting market prices. In addition, SCE questioned whether the gas floor is necessary simply to align storage with hydro or gas-fired resources. As a result, SCE requested scenario analysis across high-gas-price, low-price, and negative-price conditions before making a final determination on the value of including this component.

DMM strongly opposed the inclusion of the gas floor in the storage default energy bid. DMM argued that gas prices are not related to storage marginal costs and therefore should not be incorporated into a storage-specific default energy bid. Furthermore, DMM noted that the storage default energy bid should focus only on reflecting storage opportunity costs rather than the costs of gas or other generation. DMM also raised questions regarding the ISO's analysis on the frequency with which the gas floor component would set the storage default energy bid. Specifically, DMM noted that the gas floor component binds

infrequently and questioned why it should set the default energy bid during periods when electricity prices are low. In this context, DMM recommends that any concern about day-ahead versus real-time price divergence be addressed through a real-time adjustment scalar rather than a gas-price floor.

CPUC ED also opposed retaining the gas floor within the new storage default energy bid formulation. CPUC ED agreed with DMM that gas prices are not a driver of storage marginal costs and therefore lack a strong theoretical basis for inclusion in a storage default energy bid. Moreover, CPUC ED expressed concern that the gas floor could unnecessarily inflate default energy bid values and increase costs under some market conditions. As such, CPUC ED recommended focusing on accurately estimating storage marginal and opportunity costs rather than maintaining consistency with hydro-resource methodologies.

In sum, supporters of the inclusion of the gas floor view it as a practical risk-management tool that protects storage resources from underestimating future prices and opportunity costs. Conversely, opponents view the gas floor as an unjustified gas-generation proxy that is inconsistent with the goal of basing storage default energy bids on storage costs. Overall, even stakeholders that support retaining the gas floor generally request additional analysis, transparency, and post-implementation review.

4.1.2.1. ISO response to comments on the pertinence of the gas floor

To provide more clarity and information on the impact of the inclusion of the gas floor, the ISO performed a series of analyses focused on the April – July 2026 period. The ISO selected this period as it includes the timeframes where the revised straw proposal's analysis suggested the gas floor would be binding.[5] Importantly, the analyses presented in this subsection follow similar assumptions as those included in response to the comments regarding the scaling step.

It is important to note that the analyses presented herein also consider the impacts of the scaling step, which only influences the value relative to the price-based opportunity cost component. As a result, the ISO found that the likelihood of the gas floor being the binding component for the proposed storage default energy bid decreased as the scaling step was incorporated, a dynamic that is explained in more detail in the paragraphs below.

When looking at the April – July 2026 period, the analyses find that the inclusion of the scaling step significantly impacts the likelihood of the gas floor being the binding component. Figure 6 below shows that the frequency of the gas floor component setting the default energy bid is greatly diminished across most UDCs under the revised straw proposal with a scaling step, relative to its alternative without the scaling step, with the exception of VEA. When looking at this data at a system level; that is, not by UDC, the analysis finds that the frequency of the gas floor setting the default energy bid value is consistently lower in the April through May period and relatively stable in the June through July period, as shown in

[5] This value is based on FRCISO fuel region, which is set by the minimum of all custom fuel regions used by gas resources in the CAISO balancing authority area.

Figure 6. Notably, under the revised straw proposal with a scaling step, the gas floor sets the default energy bid most frequently in May, but that frequency is still under 2% of resource-days.[6]

Figure 6. Share of Resource-Days in which the gas floor set the storage default energy bid, by UDC

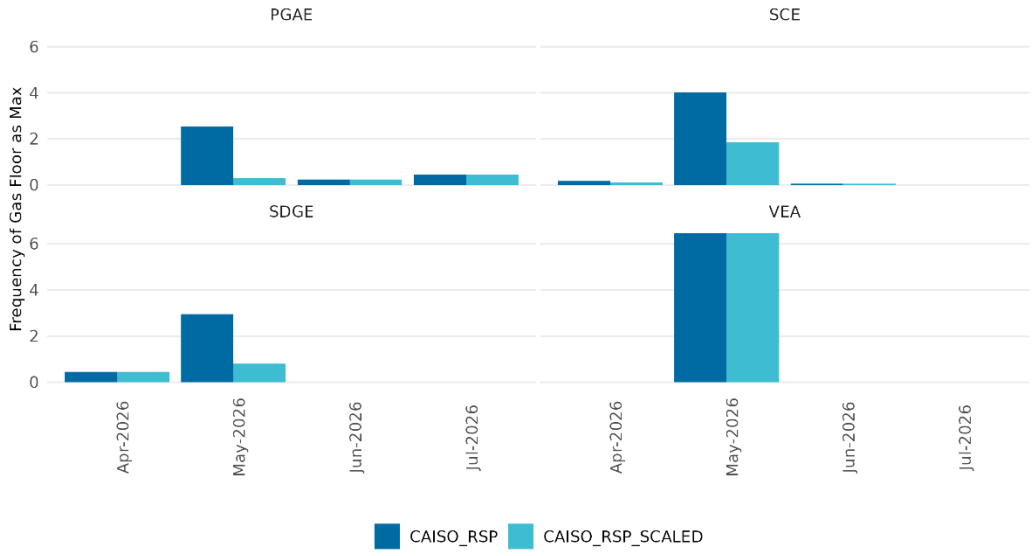
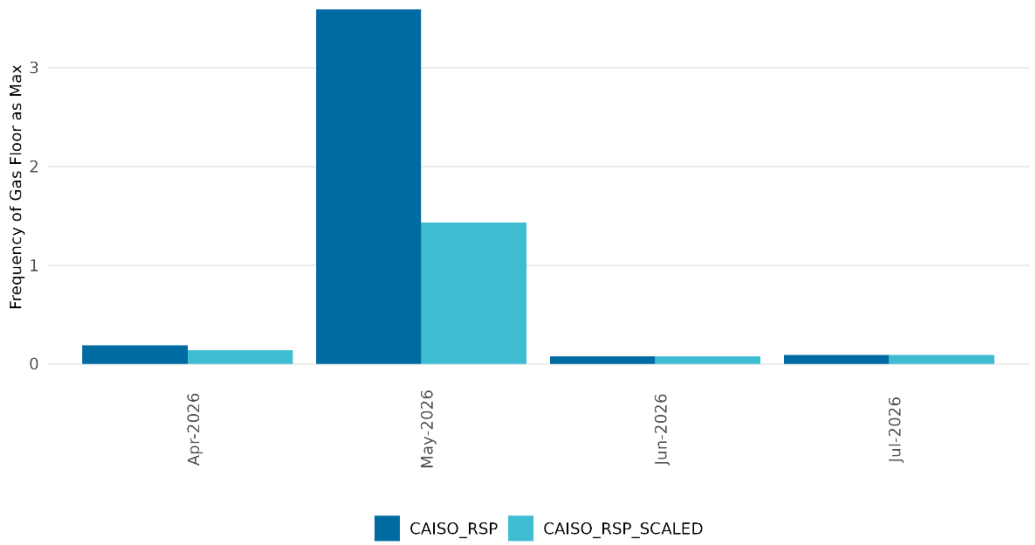


Figure 7. Share of Resource-Days in which the gas floor set the storage default energy bid



[6] Resource-days seek to alleviate the methodological challenges related to the fact that the number of resources participating varies by day. As such, a resource-day is equivalent to saying that a resource was available for one day. Therefore, resource-days are a way of counting both how many resources you have and how long they're available. Several figures in this paper show the y-axis as percentage of resource-days. This can be understood as the share in which the conditions in the x-axis were met all resource-days in the dataset.

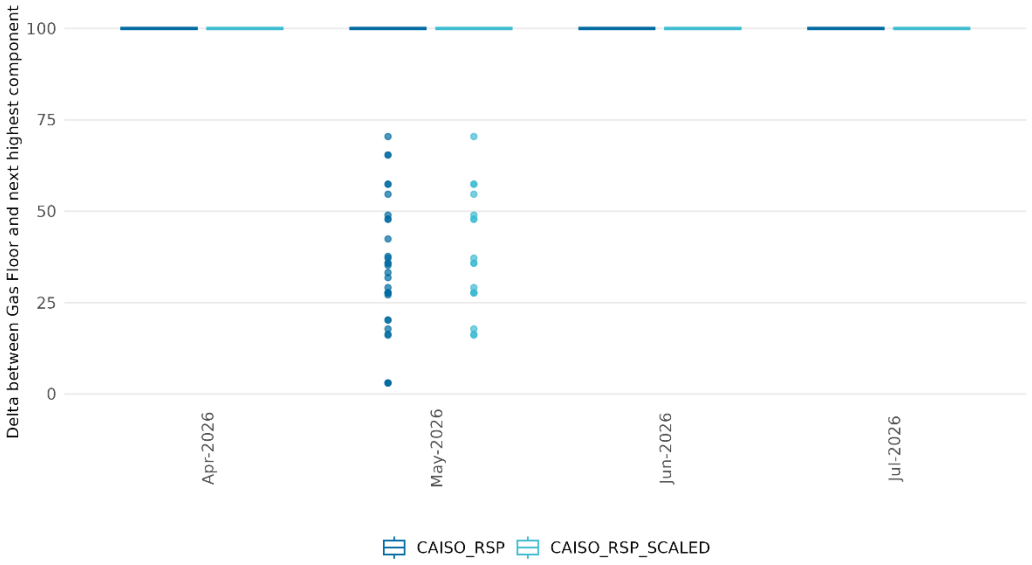
After analyzing the frequency with which the gas floor component binds, the ISO sought to determine the effect the gas floor has on the default energy bid value. To do so, the ISO estimated the difference between the value of the gas floor component and the value of the next highest component. This difference, expressed in percentages, conveys how much higher the default energy bid value was due to the inclusion of the gas floor relative to an alternative implementation that would not have included the gas floor component. As stated before, the ISO has found that, the vast majority of the time, the gas floor component is not binding. As such, the impact of the gas floor on the value of the default energy bid is only material in the infrequent event that this component binds.

Figure 8 below shows the difference between the gas floor and the next highest component. This figure is a box plot, a chart that summarizes the distribution of numerical data by showing its center, spread, and potential outliers. The line inside the box represents the median, while the bottom and top of the box represent the 25th and 75th percentiles, meaning the box contains the middle 50% of the data. The whiskers show the range of typical values, while individual points beyond the whiskers generally indicate potential outliers.

In general, a larger box or longer whiskers indicate greater variability in the data. Figure 8 however, shows the box and whiskers as a single line along the 100% value. This means that there is little or no variation among the middle 50% of the observations, so the 25th percentile, median, and 75th percentile are the same or very close together. In practical terms, because the data set in Figure 8 focuses on the days in which the gas floor was the highest component of the default energy bid, values at or near the 100% y-axis value indicate that the next highest component was near zero, meaning that either the variable operations cost was zero or the price-based opportunity cost was equal to or lower than zero. Thus, the inclusion of the gas floor can result in a material default energy bid value even when other components of the default energy bid are low, albeit this is only material in a very limited set of circumstances, as shown in Figures 6 and 7.

When looking at the outlier values, two conclusions emerge. The first one is that the revised straw proposal with a scaling step limits the number of observations in which the gas floor set the default energy bid relative to the alternative without a scaling step. The second one is that, under the revised straw proposal with a scaling step, when the gas floor is binding, its value is between 20 and 75% higher than the next highest component, a wide range. This suggests that the impact of the inclusion of the gas floor in the default energy bid is modest in terms of frequency and highly variable in terms of magnitude.

Figure 8. Magnitude of difference between Gas Floor and Next Highest DEB component, relative to Gas Floor



Overall, the ISO views the inclusion of the gas floor as a guardrail that can capture changing price dynamics between day-ahead and real-time conditions when the price-based opportunity cost component and its applicable scaling process are not sufficient. Today, across the vast majority of resource-days, the day-ahead locational marginal prices, on which the price-based opportunity cost component is based, reflect the trend of the gas floor. As a result, the gas floor is binding in very limited circumstances: when there is a separation between the gas floor and day-ahead locational marginal prices that is significant enough that even the scaling step cannot cover such a difference. In this context, the inclusion of the gas floor is an addition that can enhance the accuracy of the estimation of opportunity costs when there is a material divergence between the gas floor and the price proxies leveraged to inform the opportunity cost component. Its inclusion is seldom impactful but beneficial to properly value remaining state-of-charge when a divergence in prices materializes between the day-ahead and real-time markets.

4.1.3. Comments on the time-of-day multiplier

Comments about the use of values below 1.0

While most commenters agree on the value of including a time-of-day multiplier, stakeholders remain divided on which values the time-of-day multiplier should take. A key area of debate relates to whether the time-of-day multiplier should fall to a value below 1.0 during and after the later of either (1) the earliest of the Nth highest priced day-ahead LMPs, or (2) hour ending 18. The debate centers on whether peak-hour opportunity costs remain significant due to next-day discharge opportunities or whether the default energy bid should decline once the highest-value discharge periods have passed. In addition, this debate is also informed by stakeholder perspectives that posit the revised straw proposal

has included several modifications to avoid the underestimation of opportunity costs while doing little to avoid the overestimation of opportunity costs.

Three commenters support the time-of-day multiplier assuming values lower than 1.0 in the later hours of the day. DMM submitted comments in support of allowing values both above and below 1.0. Specifically, DMM recommended a 0.8 time-of-day multiplier during and after peak hours, arguing that storage opportunity costs decline as future discharge opportunities diminish. Overall, DMM argued that limiting the time-of-day multiplier values to the range of 1.0–1.4 continues to overestimate storage marginal costs during the hours when market power concerns are greatest. In this context, DMM argued that a 0.8 multiplier better reflects future charging and discharging opportunities extending into overnight and next-morning periods.

The CPUC ED also questioned the use of a 1.0 floor for the time-of-day multiplier. CPUC ED expressed concern that keeping time-of-day multiplier values at or above 1.0 may overstate storage opportunity costs during peak demand periods. As such, CPUC ED supported further consideration of DMM's proposal to allow time-of-day multiplier values below 1.0, with HE 18 serving as a safeguard against reducing the multiplier too early.

Similarly, Cal Advocates agreed with DMM that opportunity costs are highest earlier in the day and decline during peak and post-peak hours. Noting that the revised straw proposal may continue to overestimate opportunity costs during peak periods while recognizing the value of stored energy in the following trade date, Cal Advocates proposed a modified approach where the time-of-day multiplier would have a value of 1.4 before the later of either (1) the earliest of the Nth highest priced day-ahead LMPs, or (2) hour ending 18 (only in real-time), then it would take on a value of 0.8 during the switch hour and the following n-1 hours (where n equals the duration of the asset), and finally it would increase once more to 1.0 for the remainder of the trade date. Cal Advocates argues that this proposed modification better balances legitimate next-day opportunity costs with the need to mitigate market power during evening peak hours.

Conversely, four stakeholders opposed the notion of having the time-of-day multiplier assume a value below 1.0. CESA opposed this notion noting that it could introduce gaming opportunities and create undesirable differences between day-ahead and real-time default energy bids. CESA, similarly to Cal Advocates, also recommended an alternative implementation of the time of day multiplier to address the challenges and concerns related to the potential to over- or underestimate opportunity costs. Specifically, CESA asked the ISO to consider a dynamic trigger for activating the 1.4 multiplier, such as significant deviations between day-ahead and real-time system-wide state-of-charge, rather than applying it universally.

Both NV Energy and WPTF supported maintaining time-of-day multipliers at or above 1.0. WPTF opposed proposals to reduce the multiplier below 1.0, arguing that such values would understate opportunity costs and fail to account for preserving state-of-charge for next-day discharge opportunities. Finally, SCE generally supported the proposed time-of-day framework, including the 1.0 value for the time-of-day multiplier outside the peak opportunity-cost period.

Comments about the hour-ending 18 floor

Most stakeholders supported the revised straw proposal's incorporation of DMM's suggestion to modify the time-of-day multiplier to change at the later of either (1) the earliest of the Nth highest priced day-ahead LMPs, or (2) hour ending 18 (only in real-time). A majority of stakeholders noted that this modification is an improvement over prior proposals that would have had the time-of-day multiplier change during the hour that set the price-based opportunity cost component.

Comments on the need for additional analysis

Given the inclusion of several new upward adjustments, several commenters requested additional empirical analyses to assess the overall effects of the time-of-day multiplier, the scaling step, and the price-based opportunity cost multiplier. CalCCA requested additional analysis on the interaction between the time-of-day multiplier, the scaling methodology, and gas floor to ensure the combined design does not overstate opportunity costs. The ISO provides these analyses in the prior response subsections.

Taking a different view, PG&E encouraged implementation of the framework without delaying for additional studies given the consensus around the importance of enhancing the storage default energy bid and the support the time-of-day concept has garnered. Similarly, Terra-Gen recommended post-implementation analysis to better understand how the various default energy bid components, including the time-of-day multipliers, influence the final default energy bid.

Comments on updating the various default energy bid components

Several stakeholders supported the development of a framework that would allow for ongoing monitoring and periodic reassessment of different parameters and multipliers included within the time-of-day framework after implementation.

PG&E noted that it sees time-of-day multipliers as empirically-based parameters that should be monitored and reviewed after implementation. As such, PG&E would support a governance structure that would allow these values to be adjusted through stakeholder processes based on observed market outcomes. Similarly, SDG&E supported the establishment of a process that would periodically review multiplier values as storage dispatch patterns evolve. Finally, SCE recommended documenting the specific methodology of the new time-of-day storage default energy bid in the BPM and establishing a formal process to periodically reassess multiplier values using updated operational data.

4.1.3.1. ISO response to comments on the time-of-day multiplier

The ISO appreciates stakeholder feedback regarding whether the time-of-day multiplier should be permitted to assume values below 1.0 during peak and post-peak hours. As described above, DMM, CPUC ED, and Cal Advocates argue that storage opportunity costs generally decline as the trade date progresses and the highest-value discharge opportunities pass. These commenters therefore contend that maintaining a multiplier of at least 1.0, particularly during evening peak hours, may overstate

storage opportunity costs at precisely the times when effective market power mitigation is most important. The ISO understands the basis for this concern and agrees that the default energy bid should not systematically overstate storage marginal costs.

However, the ISO does not agree that introducing time-of-day multiplier values below 1.0 is the appropriate means of addressing this concern. In particular, the ISO does not believe that the value of stored energy should be assessed solely based on the remaining discharge opportunities within the current real-time trade date, particularly when data shows growing use of storage discharging during morning ramp periods. Storage resources can retain energy for use during subsequent hours, including charging and discharge opportunities extending into the following trade date. Consequently, the fact that the highest-priced hours of the current trade date may have passed does not necessarily mean that the opportunity cost associated with stored energy has fallen below the opportunity cost otherwise reflected in the default energy bid.

This consideration is particularly important when comparing the day-ahead and real-time default energy bids. The ISO would be concerned with establishing a real-time methodology that, by design, could apply a downward adjustment to the default energy bid based primarily on the progression of the trade date, notwithstanding the continued value of stored energy beyond that trade date. For this reason, the ISO believes maintaining a floor of 1.0 for the time-of-day multiplier is conceptually appropriate and does not propose adopting DMM's recommended 0.8 multiplier or a similar value below 1.0. The ISO also believes that retaining a 1.0 floor avoids some of the concerns identified by CESA regarding potentially undesirable differences between day-ahead and real-time default energy bids.

At the same time, the ISO acknowledges that maintaining a 1.0 floor does not fully resolve the separate concern raised by DMM, CPUC ED, Cal Advocates, and other commenters regarding the potential overestimation of opportunity costs. The ISO considers this concern reasonable, particularly when considered in the context of the revised straw proposal as a whole. Under that proposal, the 1.4 time-of-day multiplier would generally apply for most hours of the day and would do so every trade date. The proposal also contains other adjustments intended to reduce the risk that the storage default energy bid understates legitimate opportunity costs, including the scaling step and the price-based opportunity cost component. Given these cumulative adjustments, the ISO agrees that it is appropriate to consider whether applying the higher 1.4 multiplier broadly and every day could, under some market conditions, produce a default energy bid that overstates storage opportunity costs.

In this context, the ISO sees merit in further exploring CESA's suggestion that the higher multiplier could be activated based on observed market conditions rather than applied universally. For example, a dynamic trigger could compare aggregate state-of-charge conditions expected in the day-ahead market with aggregate state-of-charge conditions observed in real time. A sufficiently large decline in real-time state-of-charge relative to day-ahead expectations could indicate that stored energy has become scarcer than anticipated and that storage resources face greater opportunity costs, providing a more direct basis for activating the 1.4 multiplier. Conversely, when real-time state-of-charge remains broadly consistent with day-ahead expectations, the default energy bid could retain the lower 1.0 multiplier.

The ISO sees at least three potential advantages to such an approach. First, a dynamic trigger could reduce or eliminate the perceived need for multiplier values below 1.0. Rather than addressing potential overestimation by reducing the default energy bid during particular hours based on a predetermined schedule, the framework could address the concern by applying the higher 1.4 adjustment only when market conditions provide an affirmative indication that higher opportunity costs are present. Second, the approach could reduce the likelihood of overestimating opportunity costs because the higher multiplier would no longer apply automatically during most hours of every trade date. Third, a market-condition-based trigger could potentially reduce the need to periodically recalibrate fixed time-of-day parameters as storage penetration, dispatch patterns, grid conditions, and the overall supply mix evolve. This latter consideration is responsive to comments from PG&E, SDG&E, and SCE regarding the importance of periodically reassessing empirically based parameters after implementation.

There are, however, important policy and implementation questions that would need to be resolved before the ISO could adopt a triggered framework. One question is how the approach would interact with the initial day-ahead state-of-charge and bid cost recovery framework. A second question concerns the geographic scope of the state-of-charge metric. For example, the ISO and stakeholders would need to determine whether aggregate state-of-charge should be calculated for resources by balancing authority area, across a broader market footprint, or using some other aggregation that best reflects the conditions influencing storage opportunity costs. A third and particularly important question concerns the design and calibration of the trigger itself. The ISO would need to evaluate how large a divergence between day-ahead and real-time aggregate state-of-charge should be required before the 1.4 multiplier is activated. For example, a framework could consider whether real-time aggregate state-of-charge would need to be 20% below an appropriate day-ahead benchmark, although further analysis would be necessary to determine whether that or another threshold is empirically justified. The ISO would also need to consider whether the trigger should be binary or graduated.

The ISO believes these questions are resolvable but would require additional stakeholder discussion and analysis. Accordingly, the ISO is open to further exploring a triggered alternative before reaching a final decision if stakeholders believe the potential benefits warrant the additional policy development. This approach would also be consistent with the broader stakeholder interest identified in comments in establishing a framework that can respond to changing storage dispatch patterns and market conditions rather than relying exclusively on fixed parameters.

Absent sufficient stakeholder interest in pursuing this alternative, the ISO continues to believe that the framework reflected in the revised straw proposal, including the 1.0 floor, the HE 18 safeguard, the 1.4 multiplier, and the scaling step, provides a reasonable basis for the draft final proposal. The ISO therefore welcomes stakeholder feedback on whether it should retain that framework for the draft final proposal or instead further develop a dynamic trigger for application of the higher 1.4 multiplier. In particular, feedback on the appropriate state-of-charge metric, geographic scope, trigger threshold, and interaction with the day-ahead and bid cost recovery frameworks would help inform whether the triggered approach represents a preferable path forward.

4.2. Draft Final Proposal on Storage Default Energy Bid Enhancements

In this paper, the ISO has presented arguments and analysis to address stakeholder comments relative to the revised straw proposal's use of a scaling step, its consideration of the gas floor, and the definition of the time-of-day multiplier values. The ISO proposes to retain consideration of a scaling step as part of the storage default energy bid methodology because it complements the time-of-day multiplier and reduces the risk that mitigation interferes with efficient state-of-charge management. The ISO's analysis indicates that, relative to the current methodology, the revised straw proposal with scaling more frequently produces a default energy bid below the average LMP for four hours or less, while less frequently producing a default energy bid below the average LMP for more than four hours. The ISO believes these results demonstrate that the scaling step provides a reasonable balance between effective mitigation and preserving sufficient opportunity costs to reduce the likelihood that mitigation drives incremental dispatch in earlier hours and prematurely exhausts a resource's state-of-charge.

The ISO also proposes to retain the gas floor as a targeted guardrail for circumstances in which day-ahead prices do not sufficiently reflect real-time price conditions. For the vast majority of resource-days, the day-ahead LMPs used to calculate the price-based opportunity cost component already reflect movements in the gas floor, meaning the gas floor is rarely binding. However, when gas prices materially diverge from the day-ahead LMPs and the scaling step is insufficient to account for that divergence, the gas floor provides additional protection against understating opportunity costs. The ISO therefore views the gas floor as a narrowly applicable but valuable component that improves the methodology when meaningful differences emerge between the day-ahead price proxies underlying the opportunity cost calculation and real-time market conditions.

The ISO also proposes an adjustment to the definition of the charging default energy bid in both day-ahead and real-time. Namely, the ISO proposes to modify the charging default energy bid calculation to account for the inefficiency inherent to storage resources. To do so, the ISO proposes to divide the variable operations cost component by the asset's round trip efficiency, a value that is between 0 and 1 that represents the ratio of energy put into the resource to energy retrieved from the resource. This value is static and is registered in Master File as "Energy Efficiency." With this inclusion, the ISO can ensure that the difference between the discharging and the charging default energy bid is consistent with the costs and characteristics of the storage resource, further minimizing the risks posed by charging side mitigation.

Box 2. Draft Final Proposal on the Time-of-Day Storage Default Energy Bid

$$DA\ Discharge\ DEB = Max(Variable\ Operations\ Cost * 1.1, PB_OC * 1.1, Gas\ Floor * 1.1)$$
$$DA\ Charge\ DEB = (DA\ Discharge\ DEB - (Variable\ Operations\ Cost/RTE))$$

$$RT\ Discharge\ DEB = Max(Variable\ Operations\ Cost * 1.1, PB_OC * 1.1, Gas\ Floor * 1.1) * TOD\ Multiplier$$
$$RT\ Charge\ DEB = (RT\ Discharge\ DEB - (Variable\ Operations\ Cost/RTE))$$

Where:

$Variable\ Operations\ Cost$: Represents cycling and other operational costs

PB_OC: Price-based Opportunity Cost

- In DA for EDAM, calculated by scaling the MPM outputs based on differences relative to DA LMPs
- In RT for EDAM, calculated by scaling DA LMPs based on differences relative to RT LMPs
- In RT for WEIM, calculated by scaling DGAP based on differences relative to RT LMPs

$TOD\ Multiplier$: A value of 1.4 before the later of either (1) the earliest of the Nth highest priced day-ahead LMPs, or (2) hour ending 18 (only in real-time); a value of 1.0 afterwards.

$Gas\ Floor$: 11,068 MMBtu/MWh * Fuel region gas price

RTE: Round trip efficiency, a value that is between 0 and 1 that represents the ratio of energy put into the resource to energy retrieved from the resource

On the matter of the time-of-day multiplier, the ISO appreciates stakeholder concerns that maintaining time-of-day multipliers at or above 1.0 could overstate storage opportunity costs after the highest-value discharge opportunities have passed. However, the ISO does not support multipliers below 1.0 because storage market opportunities extend beyond the current real-time trade date, and stored energy may retain value for subsequent charging and discharging opportunities. Accordingly, the ISO believes a 1.0 floor remains conceptually appropriate and avoids establishing a real-time default energy bid that could be systematically reduced relative to the day-ahead default energy bid simply as the trade date progresses.

At the same time, the ISO recognizes the potential for the revised straw proposal to overestimate opportunity costs, particularly because the 1.4 multiplier would generally apply during most hours of every trade date alongside other adjustments, including the scaling step and price-based opportunity cost component. The ISO therefore sees merit in further exploring CESA's suggestion to apply the 1.4 multiplier only when market conditions indicate heightened opportunity costs. For example, a dynamic

trigger based on a material decline in aggregate real-time state-of-charge relative to day-ahead expectations could provide a more targeted basis for applying the higher multiplier. Such an approach could reduce the need for multipliers below 1.0, lower the risk of overestimating opportunity costs, and reduce the need to periodically recalibrate fixed time-of-day parameters as market conditions evolve.

A triggered approach would nevertheless require additional policy development, including determining how the trigger would interact with initial day-ahead state-of-charge and bid cost recovery, how aggregate state-of-charge should be defined geographically, and what level of divergence between day-ahead and real-time state-of-charge should activate the 1.4 multiplier. Absent sufficient stakeholder interest in further developing this alternative, the ISO believes the revised straw proposal, including the 1.0 floor, HE 18 safeguard, 1.4 multiplier, and scaling step, provides a reasonable basis for the draft final proposal. The ISO welcomes stakeholder feedback on whether to retain this framework or further explore a dynamic trigger before reaching a final decision.

5. Hybrid Default Energy Bids

In the July 2026 straw proposal, the ISO provided an overview of three different approaches to estimate a default energy bid applicable to hybrid resources: the greater-of approach with a minimum share requirement, the largest component approach, and the weighted average approach.[7] The paper detailed each approach and its relative strengths, seeking stakeholder feedback on a preferred path.

The greater-of option ensures hybrid resources are similarly positioned in the bid stack to resources with similar costs and technology. The minimum share requirement would make it so that a component must constitute at least N% of all installed capacity that is part of the hybrid resource for its default energy bid value to be considered as part of the greater-of approach. This requirement ensures that hybrid resource default energy bids reflect the marginal cost characteristics of a significant portion of the resource.

In the straw proposal, the ISO also sought stakeholder feedback on the percentage at which the minimum share requirement should be set, if stakeholders preferred the greater-of approach. Under this path forward, if all components were to fail the greater-of approach's minimum share requirement, the largest component's default energy bid would be leveraged for the hybrid resource. The ISO also noted that the hybrid default energy bid will be implemented no sooner than the storage default energy bid proposed earlier in this paper to allow hybrid resources with storage components to also benefit from the new storage default energy bid methodology.

[7] Under the greater-of approach, a hybrid resource's default energy bid would be equal to the greatest of the default energy bid values applicable to each of the components that make up that hybrid resource. Under the largest component approach, the default energy bid for the entire hybrid resource would be equal to the default energy bid of its largest component. Under the weighted average approach, the default energy bid for the entire hybrid resource would be the weighted average of its components' default energy bids. More information can be found in the Straw Proposal on Default Energy Bids, Uplift, and State-of-Charge Management Topic Groups published July 15, 2026.

Given stakeholder support for the greater-of approach presented in the straw proposal, the revised straw proposal proposed using the greater-of approach with minimum share requirement. In response to stakeholder request, the revised straw proposal also provided additional data to stakeholders on the composition of the current hybrid resource fleet. This analysis found that over 97% of storage capacity in a hybrid configuration would have all components eligible with a minimum share requirement of 30%. In consideration of this data, the ISO proposed a 30% minimum share requirement.

5.1. Stakeholder feedback on the Hybrid Default Energy Bids Revised Straw Proposal

Ten stakeholders provided feedback on the hybrid default energy bid revised straw proposal. Eight stakeholders expressed general support for the proposal including a minimum share requirement of 30%.[8] DMM supported the proposal as a reasonable near-term solution, continuing to recommend additional enhancements to the hybrid default energy bid that more accurately reflect the costs and operational characteristics of hybrid resources as integrated systems composed of multiple generation technologies.

While supportive, SDG&E, Cal Advocates, and CalCCA recommended the ISO monitor the hybrid default energy bid after implementation. SDG&E and Cal Advocates requested the ISO periodically review the 30% minimum share requirement to help determine whether the threshold remains effective or if future refinements may be warranted based on observed market performance and stakeholder experience. CalCCA requested that the ISO monitor whether the hybrid default energy bid methodology results in default energy bids that materially exceed the costs of the component providing incremental energy or otherwise weakens market power mitigation. CalCCA stressed that they are particularly concerned regarding hybrids composed of two dispatchable technologies, such as gas-plus-storage resources.

CESA, Terra-Gen, WPTF, and SCE provided targeted feedback on the treatment of existing resources with a component that does not meet the 30% minimum threshold. In addition, CESA and Terra-Gen provided comments on the interaction between mitigation and dynamic limits usage. These two topics are discussed further in the following sub-sections.

5.1.1. Comments on the application of the minimum share requirement

CESA, Terra-Gen, SCE, and WPTF provided targeted feedback on the application of the minimum share requirement to existing resources. CESA, Terra-Gen, and WPTF raised concerns with applying the minimum share requirement to existing resources because current hybrid plants did not have this information to consider when sizing their components.

CESA recommended that hybrid resources that have a component which represents less than the minimum share be grandfathered into not being subject to mitigation, as they currently are. CESA also recommended that the ISO provide a clear definition of “installed capacity” used to calculate the share of the hybrid resource.

[8] CalCCA, CESA, DMM, CPUC ED, Cal Advocates, PG&E, SDG&E, and SCE.

In written comments, Terra-Gen indicated support for the inclusion of a 30% minimum share requirement provided it is applied prospectively and that existing resources can access any default energy bid from existing installed technologies.[9] WPTF offered a similar perspective, noting that the ISO should consider either grandfathering all existing hybrid resources so they can use the higher of their component default energy bids without a minimum share threshold, or setting the threshold at the lowest component percentage currently on the system so as to ensure existing resources are not impacted by such a requirement.

SCE stated that a uniform threshold may not appropriately address every configuration. SCE recommends that CAISO clarify whether a hybrid resource falling below the 30% threshold could seek an alternative or negotiated default energy bid treatment when it can demonstrate that the greater-of approach better represents its operating characteristics and costs.

5.1.1.1. ISO Response to comments on the application of the minimum share requirement

The ISO believes that once a hybrid default energy bid methodology is implemented, all hybrid resources should be subject to market power mitigation so as to (1) ensure consistent treatment of all hybrid assets and (2) help ensure hybrid components are similarly situated in market power mitigation to standalone resources with similar technologies and cost structures. The ISO is open to applying the minimum share requirement only prospectively in response to stakeholder concerns that existing resources were not developed with a default energy bid construct in mind. As noted in prior papers, the incorporation of the minimum share requirement seeks to ensure that a hybrid resource does not include a minimal amount of a given technology so as to access a higher default energy bid. As stakeholders mentioned in their comments, this is not an incentive that drove the development of existing hybrid resource configurations, but it may be relevant for new resources. In this context, by applying this rule prospectively, the ISO can ensure that the greater-of approach does not incentivize the development of hybrids with minimal amounts of certain components with the sole purpose of accessing a higher default energy bid.

In regards to SCE's request to clarify whether a hybrid resource with a component falling below the 30% threshold could seek an alternative or negotiated default energy bid, the ISO notes that the tariff provides that any resource can seek a negotiated option if the scheduling coordinator believes the default energy bid options offered do not provide sufficient flexibility to reflect resource-specific costs.[10] The proposed greater-of methodology is meant to provide a reasonable, technology-neutral representation of a hybrid resource's economic costs. The 30% minimum share requirement ensures hybrid resource default energy bids reflect the characteristics of a significant portion of the hybrid resource. Stakeholders generally support the concept that a component representing less than 30% of a hybrid resource may represent too small of a portion for its default energy bid value to be considered

[9] The ISO understands this as Terra-Gen requesting that all existing hybrid resources should be able to have a default energy bid set by any existing component, even if the share of that component is less than 30%.
[10] For more information, see CAISO Tariff § 39.7.1.3

when setting the hybrid resource default energy bid through the greater-of methodology. As a result, while recognizing that the tariff allows for the consideration of a negotiated default energy bid, the ISO does not currently believe that the presence of components that do not meet the minimum share requirement would be sufficient to merit a negotiated alternative.

In response to CESA's request to provide a clear definition of "installed capacity" when determining how the minimum share is calculated, the ISO shares two potential methodologies to define how the relative sizes of the components would be considered as part of the greater-of approach's minimum share requirement. The ISO seeks feedback on these two potential methodologies and any additional potential methodologies from stakeholders. The first option uses the sum of the components' PMaxes to define the share each component represents. The second option uses the hybrid resource PMax to define the share each component represents. For example, consider a hybrid resource that has two components. The first component has a PMax of 40 MW. The second component has a PMax of 110 MW. The PMax for this hybrid resource is 100 MW.

Under Methodology 1, the sum of component PMaxes would be 150 MW,[11] meaning that the 30% minimum share requirement would be 45 MW. Component 1 would have a PMax smaller than the minimum share requirement and therefore would not be eligible for the greater-of calculation. Since the only eligible component for calculation is Component 2, Component 2's default energy bid value would be the default energy bid for the whole hybrid resource.

Under Methodology 2, the hybrid resource PMax would be 100 MW, meaning that the 30% minimum threshold would be 30 MW. Component 1 would have a PMax greater than the minimum threshold and would be eligible for the greater-of calculation. The calculation would take the greater-of the default energy bid values for both Component 1 and Component 2 to determine the default energy bid for the whole resource.

Table 2. Example of Minimum Share Requirement Methodologies

	Component 1 PMax	Component 2 PMax	Resource PMax	Value for 100% Minimum Share	Minimum Threshold	Component 1 eligible?
	40 MW	110 MW	100 MW			
Methodology 1 (Sum of PMaxes)	40 MW	110 MW	-	150 MW	45 MW	No, DEB is set by Component 2
Methodology 2 (Resource PMax)	40 MW	110 MW	100 MW	100 MW	30 MW	Yes, greater-of both components

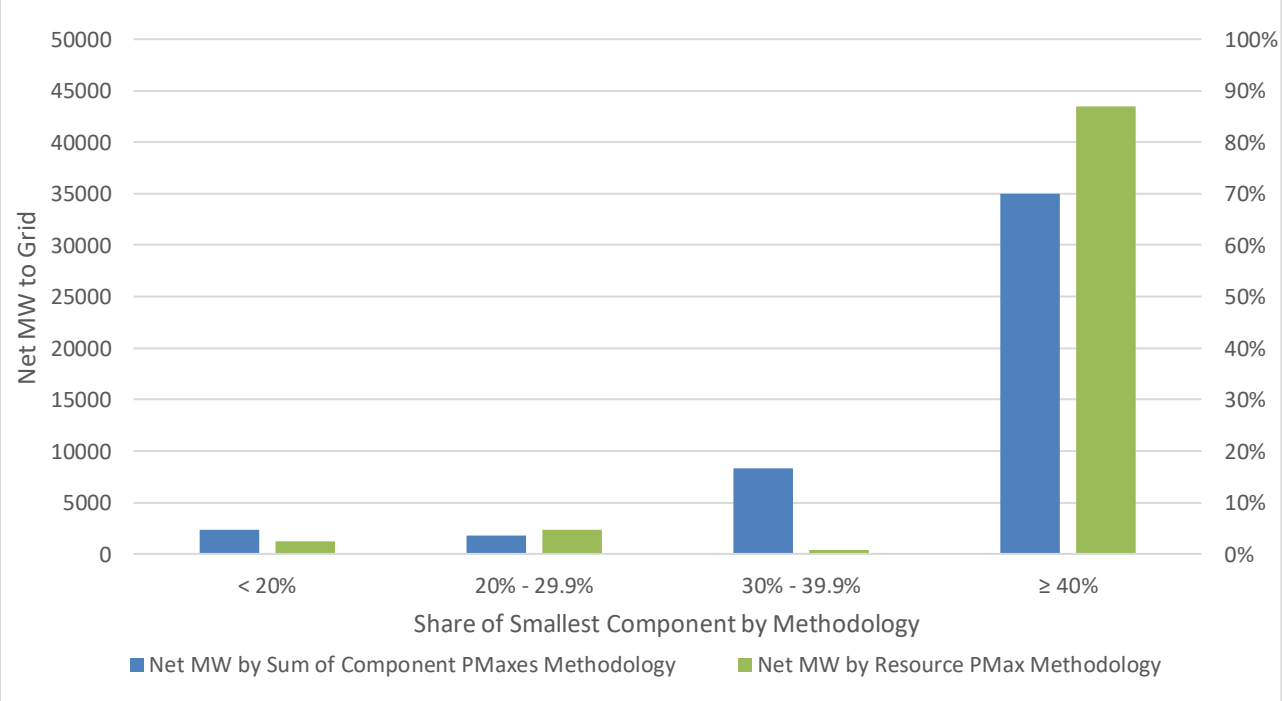
Given stakeholder feedback on the prospective application of the minimum share requirement, this paper explores how this distinction would impact mixed fuel resources in the CAISO balancing authority

[11] 40 MW from Component 1 + 110 MW from Component 2

area interconnection queue. Note that mixed fuel resources in the interconnection queue include both hybrid and co-located resources. Resources choose between co-located and hybrid configuration when choosing which market model to use in the New Resource Implementation process.[12] Resources may also change configurations after coming online.

The analysis in this paper finds that under both methodologies, most resources in the CAISO balancing authority area interconnection queue have all components with a PMax larger than the minimum share requirement. Under the sum of component PMaxes methodology, 141 out of 156 mixed fuel resources in the queue, representing 90% of mixed fuel interconnection service capacity, would have all components eligible for the greater-of methodology, assuming no preexisting capacity. Under the resource PMax methodology, 144 out of 156 mixed fuel resources in the queue, representing 92% of mixed fuel interconnection service capacity, would have all components eligible for the greater-of methodology, assuming no pre-existing capacity and that hybrid resource PMax will equal the resource's interconnection service capacity.

Table 3. Comparison of Minimum Share Requirement Methodologies for Mixed Fuel Resources in CAISO BAA Interconnection Queue by Smallest Component Share



The analysis in this paper finds that there is little difference between each of the methods in terms of how they would impact the mixed fuel resources included in the CAISO interconnection queue. This look at planned resources has certain limitations given its geographic focus and the fact that not all resources in the queue materialize and not all mixed fuel resources may opt for the hybrid resource pathway. As a result, the ISO welcomes additional datapoints or information that can further inform this analysis.

[12] See Public Queue Report for the most up-to-date information: Library | Public queue report | California ISO

Given the limited difference between either approach, the ISO seeks stakeholder feedback on which definition of the calculation should be pursued but notes that, to date, Methodology 1 (the sum of all the PMaxes) appears to be the most easily implementable alternative of the two given the availability of the information needed and the ability of the market to consider such data.

5.1.2. Comments on the interaction between mitigation and dynamic limit use as it relates to state-of-charge management

CESA and Terra-Gen provided comments on the interaction between mitigation and dynamic limits usage. CESA and Terra-Gen request that ISO address the misalignment between Tariff Section 30.5.6.2 and the Market Operations Business Practice Manual Section 2.1.21.1.

CESA believes that the intent of the tariff is to allow for unambiguous management of state of charge for the storage component of a hybrid through dynamic limits. This belief is based on their interpretation of the following tariff language: "Hybrid Dynamic Limits should reflect resource availability based on operating capabilities such as State of Charge and forecasted output from the variable component of a Hybrid Resource. Scheduling Coordinators may also use Hybrid Dynamic Limits to **manage onsite charging** of an energy storage component of a Hybrid Resource."

CESA requests the ISO edit the Business Practice Manual for Market Operations Section 2.1.21.1 to reflect this believed intent. The Business Practice Manual for Market Operations includes the following language "Scheduling coordinators may submit hybrid dynamic limits to reflect four scenarios: 1) ambient unavailability, 2) unavailability of renewable generation due to lack of fuel resource (e.g. wind, sun) 3) unavailability due to state of charge or 4) **to reflect onsite charging** … Resource operators **will need to manage the state of charge of any storage component through typical (Price, MW) bid submissions.**" CESA believes the language in bold is disconnected from the tariff's language in bold allowing scheduling coordinator use of hybrid dynamic limits to "manage onsite charging."

Terra-Gen believes it is premature to apply a default energy bid to hybrids without clearer tools for managing the state-of-charge of hybrids given that the market model does not manage it as it does for standalone and co-located storage. Terra-Gen argues that, while scheduling coordinators can currently use economic bidding to manage the state-of-charge of hybrids, this instrument is in fact unavailable in intervals when a resource would be mitigated. As such, Terra-Gen states that economic bidding is therefore not a tool that scheduling coordinators can use under mitigation as the very act of mitigation takes that means away from the scheduling coordinator.

Terra-Gen reiterates that if the ISO agrees that dynamic limits are an appropriate tool to manage state-of-charge of hybrids, edits to the BPM are needed to reflect this. Alternatively, if ISO does not agree that dynamic limits are an appropriate tool to manage the state-of-charge of hybrids, stakeholders will need additional clarity on ISO's expectation on proper state-of-charge management given that economic bids are not a viable tool to use under mitigation.

5.1.2.1. ISO Response to comments on the interaction between mitigation and dynamic limit use as it relates to state-of-charge management

The ISO does not see misalignment between the policy intent and implementation of dynamic limits across the tariff and relevant BPMs. Dynamic limits "reflect" inputs that are not in the control of scheduling coordinators, such as the forecasted output from the variable component. Additionally, dynamic limits can be "used" by scheduling coordinators to reflect onsite charging of an energy storage component of a hybrid resource, while remaining consistent with what they are required to reflect. As such, dynamic limits are a data submission requirement intended to ensure scheduling coordinators submit the information needed to ensure the market can issue feasible dispatch instructions.

The tariff states that "Scheduling Coordinators may also use Hybrid Dynamic Limits to manage onsite charging of an energy storage component of a Hybrid Resource." The tariff contains no reference to using dynamic limits for unambiguous management of state of charge, including any reference to discharging. The tariff instead states that "Hybrid Dynamic Limits should reflect resource availability based on operating capabilities such as State of Charge and forecasted output from the variable component of a Hybrid Resource."[13]

The ISO believes that the Business Practice Manual for Market Operations section 2.1.21.1 clearly follows tariff section 30.5.6.2 while adding useful additional detail on operational practice. The business practice manual states that "for every interval in which the hybrid resource has an economic bid, self-schedule, or a base schedule, the SC must submit a dynamic limit reflecting the hybrid resource's current operational capabilities to comply with Section 30.5.6.2 of the CAISO tariff." The section also states that scheduling coordinators "may submit hybrid dynamic limits to reflect four scenarios: 1) ambient unavailability, 2) unavailability of renewable generation due to lack of fuel resource (e.g. wind, sun) 3) unavailability due to state of charge or 4) to reflect onsite charging." This list reflects the cases as represented in the tariff.

The ISO believes the treatment of hybrid storage components' state-of-charge management will be consistent with the ISO's treatment of non-hybrid storage resources once market power mitigation is applied to hybrid resources. Currently, standalone storage resources manage state of charge through economic bidding while being subject to mitigation. Under the hybrid default energy bid proposal, hybrid resources will also manage state of charge through economic bidding and dynamic limits, while being subject to mitigation. Unlike co-located resources, hybrid resources have a singular tool to manage state-of-charge: they manage the interplay between the component generating units. This is, in fact, the purpose of being a hybrid resource. If a hybrid resource cannot adequately manage its own state-of-charge to meet schedules issued pursuant to the resource's own bids, the resource can change its configuration to co-located resources.

Under mitigation, the market model will similarly position similar standalone, co-located, and hybrid storage assets. Enhancements to the storage default energy bid seek to help scheduling coordinators

[13] CAISO Tariff § 30.5.6.2

manage storage asset state of charge prior to the net demand peak period. Applying the hybrid resource default energy bid and market power mitigation to hybrid resources would similarly situate hybrid storage components. For storage components that meet the minimum threshold, the hybrid default energy bid may draw directly from the storage default energy bid, including the price-based opportunity cost and the enhancements to the storage default energy bid as proposed in this paper. Therefore, hybrid resources should have similar ability to manage their storage components' state of charge under market power mitigation as similarly situated standalone storage.

Some stakeholders have been concerned about being able to manage their state-of-charge while under mitigation. The proposed storage default energy bid aims to resolve their concerns while continuing to maintain effective market power mitigation. Hybrid resources with storage components that meet the minimum share requirement and elect to have their storage components' value be represented by the storage default energy bid methodology will have the same proposed storage default energy bid value as similarly situated storage resources for use in the greater-of methodology.

Given this discussion, the ISO believes that economic bids, including the dynamic limit tool, are viable under mitigation for state of charge management similar to state of charge management for standalone and co-located storage assets. The ISO expects scheduling coordinators to use the existing tools as outlined in the tariff and BPM for state of charge management.

5.2. Draft Final Proposal on Hybrid Default Energy Bids

The draft final proposal continues to build upon the greater-of approach, as described in the September 2026 revised straw proposal, and stakeholder feedback. In summary, the ISO proposes:

- All hybrid resources will be subject to market power mitigation.
- Hybrid resources will be required to use the hybrid default energy bid unless approved for a negotiated default energy bid.
- A hybrid resource's default energy bid would be equal to the greater-of the default energy bid values applicable to each of the components that make up that hybrid resource if using the hybrid default energy bid methodology.
- A component must represent at least 30 percent of the hybrid resource's PMax, sum of component PMaxes, or alternative way to define the share for its default energy bid value to be considered as part of the greater-of approach.
    - This rule only applies to resources with a commercial operation date that is after implementation of the hybrid default energy bid. Resources with a commercial operation date that is prior to the implementation of the hybrid default energy bid can be represented by the greater-of any of their components' default energy bid values under the hybrid default energy bid.
    - The ISO seeks feedback on whether the minimum share requirement should be based on the sum of component PMaxes, resource PMax, or an alternative option. The ISO

notes that the sum of component PMaxes appears to be the most easily implementable approach.

Under the greater-of approach, a hybrid resource would have a default energy bid as follows:

1. Calculate the resource PMax, sum of the component PMaxes, or the alternative option to be determined after input from stakeholders on this draft final proposal.
2. If the resource has a commercial operation date that is after implementation of the hybrid default energy bid:
    - Review whether each component represents at least 30% of the value from step 1. Exclude components that do not represent at least 30% of the value from step 1.

    If the resource has a commercial operation date that is before or on the same day as the implementation of the hybrid default energy bid, move to step 3.

3. Calculate each eligible component's default energy bid value.
4. Compare the component default energy bid values and select whichever has the greater value as the default energy bid for the whole hybrid resource.

As noted in the September 2026 revised straw proposal, the ISO has concerns about whether the greater-of methodology alone would properly mitigate the exercise of market power for some hybrid configurations under certain circumstances. For example, consider the edge case of a 100 MW hybrid resource made up of 99 MW of solar and 1 MW of battery storage. Under this approach, if the storage default energy bid is higher than the locational marginal price default energy bid, the storage default energy bid would be used for all 100 MW of its capacity, which would likely not be reflective of the costs for the resource to produce one additional megawatt of electricity.

To ensure hybrid resource default energy bids reflect the characteristics of a significant portion of the hybrid resource, the ISO believes that any application of the greater-of approach should include a minimum share requirement. Stakeholders requested more information on the hybrid fleet prior to setting a minimum threshold. In the revised straw proposal, the ISO showed 97% of current storage capacity in a hybrid configuration would meet the minimum share requirement. In response to this data and stakeholder feedback, the ISO proposes a minimum share requirement of 30%. This would mean that a hybrid component must represent at least 30% of the resource for that component's default energy bid value to be considered in the greater-of hybrid approach for the hybrid default energy bid. Any component that constitutes less than 30% of a hybrid resource would not have its default energy bid methodology considered when calculating the hybrid default energy bid.

CESA requested the ISO better define "installed capacity" as used in the revised straw proposal to evaluate whether a component's share met the minimum threshold. In response, the ISO seeks stakeholder feedback on the methodology to define how the relative size of a component would be considered as part of the greater-of approach's minimum share requirement. Section 5.1.1.1 provides

data and discussion on two approaches: (1) sum of component PMaxes and (2) hybrid resource PMax. Importantly, while there is little difference between each of the methods in terms of how they would impact the mixed fuel resources included in the CAISO interconnection queue Methodology 1 (the sum of all the PMaxes) appears to be the most easily implementable alternative of the two given the availability of the information needed and the ability of the market to consider such data.

SDG&E and Cal Advocates requested the ISO periodically review the 30% minimum share requirement to help determine whether the threshold remains effective or if future refinements may be warranted based on observed market performance and stakeholder experience. The ISO will consider this request in future storage and hybrid resource initiatives.

In response to stakeholder feedback on whether the minimum share could be applied prospectively, all hybrid resources will be subject to market power mitigation. Hybrid resources will be required to use the hybrid default energy bid unless approved for a negotiated default energy bid. For resources that choose the hybrid default energy bid methodology, the ISO will apply the minimum share requirement to new resources. This means that the 30% minimum share requirement would only be applicable to resources with commercial operations dates later than the implementation of the hybrid default energy bid. Resources with a commercial operation date that is prior to or on the day of the implementation of the hybrid default energy bid can be represented by the greater-of any of their components' default energy bid values.

Hybrid resources with a commercial operation date later than the implementation of the hybrid default energy bid will be subject to the minimum share requirement if using the hybrid default energy bid methodology. The ISO notes that the minimum share requirement does not represent a limitation on the design of any future hybrid resource. The minimum share requirement merely establishes the minimum size a given component must represent for its applicable default energy bid value to be considered as part of the greater-of methodology for hybrid resource default energy bids. As a result, all hybrid configurations can continue to be pursued while noting that only the components that meet the aforementioned threshold could influence the default energy bid for the entire hybrid resource. As stated previously, while recognizing that the tariff allows for the consideration of a negotiated energy bid, the ISO does not currently believe that the presence of components that do not meet the minimum share requirement would be sufficient to merit a negotiated alternative.

CalCCA provided comments that the ISO should (1) further evaluate and demonstrate that applying the greater-of approach to dispatchable hybrids will not materially weaken mitigation and (2) monitor for this concern post-implementation. While the ISO believes that applying the greater-of approach to dispatchable hybrids would strengthen mitigation because currently hybrid resources are not subject to mitigation, the ISO recognizes the value of comparing the proposed storage default energy bid and the current gas default energy bid to inform this discussion. The ISO will explore this request and share with stakeholders prior to seeking Governing Body approval on this item. Decision for this item is currently targeted for Q2 of 2027.

In sum, the greater-of approach ensures that the default energy bid applicable to a hybrid resource reflects the cost characteristics of components that represent a significant share of the whole resource. Because the greater-of approach could be used for any combination of underlying components, this approach would represent a durable solution, but its implementation would require significant effort. First, implementation would require increased data collection on hybrid resources and their underlying components. Furthermore, the implementation of this approach would require the development of new data pipelines by the ISO to allow for the calculation of component-level default energy bids and their comparison.

6. Governance Classification

This proposal discusses changes to the calculation of default energy bids for storage and hybrid resources. Because these changes would apply to WEIM/EDAM Entity balancing authority areas, rather than solely the ISO balancing authority area, they fall under the WEM Governing Body's primary authority.

The WEM Governing Body has primary authority over any proposal to change or establish a tariff rule applicable to the WEIM/EDAM Entity balancing authority areas, WEIM/EDAM Entities, or other market participants within the WEIM/EDAM Entity balancing authority areas, in their capacity as participants in WEIM/EDAM. The scope of this primary authority excludes, without limitation, any other proposals to change or establish tariff rule(s) applicable only to the ISO balancing authority area or to the CAISO-controlled grid.[14] The proposed tariff changes would be "applicable to WEIM/EDAM Entity balancing authority areas, WEIM/EDAM Entities, or other market participants within WEIM/EDAM Entity balancing authority areas, in their capacity as participants in WEIM/EDAM."

The changes proposed are not limited to the ISO balancing authority area or to the CAISO-controlled grid. Accordingly, the proposed changes fall within the scope of the WEM Governing Body's primary authority. Stakeholders are encouraged to submit a response in their written comments to the proposed classification as described above, particularly if they have concerns or questions.

7. Next Steps

This paper will be discussed at a stakeholder meeting scheduled for December 3, 2026. Comments on the paper and the stakeholder meeting will be due December 17, 2026.

[14] Charter for WEIM and EDAM Governance § 2.2.1.