



Submit comment on Issue paper

Initiative: Price formation enhancements

1. Please provide a summary of your organization's general comments on the issue paper, including how the CAISO should prioritize the proposed issues in scope. *

The California Energy Storage Alliance (CESA) appreciates the opportunity to provide feedback to the California Independent System Operator (CAISO or ISO) on the Issue Paper of the Price Formation Enhancements (PFE) Initiative. CESA supports the scoping process of the ISO, as it has allowed market participants to provide input ahead of the posting of the Issue Paper, fostering a broader understanding of the issues at hand and enabling more substantial feedback from stakeholders.

In these comments, CESA offers feedback on which issues pose the greatest challenges to achieve pricing efficiency and should thus be prioritized by the ISO. Furthermore, CESA recommends a series of initial analyses to better understand which measures or proposals posed by ISO within the Issue Paper merit further development. In addition, CESA requests inclusion of an additional topic to the scope of the PFE initiative. CESA's comments can be summarized as follows:

- CESA supports consideration of higher penalty prices for ancillary service (AS) scarcity pricing.
 - CESA supports exploration of the proposal to raise penalty prices of both AS and the flexible ramping product and advises the ISO to produce examples that would capture the effects of penalty prices between \$500/MWh and \$1,000/MWh for both AS and the flexible ramping product.
- CESA strongly supports the incorporation of fast-start pricing methodologies to the markets administered by the CAISO.
 - CESA recommends the ISO estimate the price impacts of defining fast-start resources as either 30- or 60-minute start resources.
 - At this time CESA does not consider that any resource class should be excluded from the analyses.
 - These analyses should also estimate the impacts of applying fast-start pricing in either both the day-ahead and real-time markets or only the latter market.
- CESA supports the CAISO exploring a weight methodology to mitigate concerns related to multi-interval optimization for storage resources.
 - CESA recommends the ISO collaborate with experienced market participants to identify examples that could be used to test a series of what-if scenarios with different weights applied across the binding and advisory intervals.

- Modifications to the bid-cost recovery (BCR) mechanism should be considered in conjunction to the CAISO's revision of fast-start pricing rules.
- CESA requests consideration of the use of load conformance in the RT markets as part of the scope of the present initiative.

2. Please provide your organization's comments to the issues raised on scarcity pricing enhancements and feedback the CAISO should consider in preparation for the straw proposal. *

CESA supports consideration of higher penalty prices for AS scarcity pricing

Scarcity pricing refers to the process of establishing and setting prices when there is insufficient supply to cover the energy, ancillary services, or ramping product requirements. In the Issue Paper, the ISO notes that, following the events of August 2020, a series of modifications to scarcity pricing rules have been enacted.¹ These enhancements have been critical to ensure that supply receives adequate price signals in periods of grid stress, thus incenting the participation of a broader set of resources. In this context of increased weather, load, and supply variance, CESA agrees with the importance of bolstering scarcity pricing rules and processes to ensure the ISO has the adequate toolkit to preserve reliability in all hours. As noted in the comments below, CESA is particularly supportive of the ISO focusing its consideration of scarcity pricing enhancements as they relate to AS penalty prices.

While the improvements adopted following the August 2020 rolling outages have had significant impact, the ISO notes in the Issue Paper that the current energy bid caps may not provide adequate incentives to market participants, particularly during tight system conditions. Namely, CAISO has observed that load-serving entities (LSEs) face little price risk when day-ahead energy prices clear near the bid cap, thus incenting LSEs to under-schedule their load and wait for the real-time market to secure supply. On the other hand, resources scheduled for energy in the day-ahead market face little price risk when day-ahead prices clear near the bid cap if their supply is unavailable in real-time. While CESA agrees that these conditions may occur, it is unclear that energy scarcity pricing enhancements would address the issue at hand. As further developed in CESA's response to Question 6 of these comments, the systematic under-scheduling of load has created significant pricing inefficiencies, forcing the ISO to routinely use load conformance to mitigate the potential for energy shortfalls. Thus, rather than considering incremental improvements to the current energy scarcity pricing methods, the ISO should prioritize consideration of means to minimize under-scheduling that would force the usage of load conformance.

As noted in the Issue Paper, scarcity pricing is also utilized when the ISO determines that there will be insufficient supply to meet AS and ramping product requirements. This has proven to be complex since the ISO only procures incremental AS in the real-time market if the amount procured in the day-ahead market is not sufficient to meet requirements. Today, the real-time market re-optimizes ancillary services with energy only in the intervals when the real-time market must procure additional ancillary services. For this reason, AS scarcity prices do not always occur in tight conditions. In addition, the CAISO only procures AS in the fifteen-minute market and not the five-minute market.

¹ Namely, the ISO has increased the energy bid cap and power balance constraint penalty price in the pricing run from \$1,000/MWh to \$2,000/MWh, energy bids above \$1,000/MWh are now allowed, and energy from generation the ISO releases from contingency reserve to serve load is now added to the bid stack with a bid price equal to the market's applicable energy bid cap.

As a result, ancillary services scarcity pricing in the real-time market only affects fifteen-minute market prices and not five-minute prices.

Given the increased weather, load, and supply variance, CESA agrees that consideration of enhancements to AS scarcity pricing is timely and reasonable. In the Issue Paper, the ISO posed raising the penalty prices of both AS and the flexible ramping product (FRP) from its current value of around \$250/MWh to a value closer to \$1,000/MWh. The ISO argues that this would allow prices to rise more gradually to the \$1,000/MWh power balance constraint penalty price ahead of tight supply conditions. Moreover, the ISO notes that, if the flexible ramping product demand curve had a higher maximum price than the current \$247/MWh, these higher prices would be reflected in energy prices as the market forgoes greater FRP procurement. CESA supports exploration of this proposal and advises the ISO to produce examples that would capture the effects of increased penalty prices for both AS and the flexible ramping product. After reviewing the best practices overview provided by the ISO, CESA recommends considering values between \$500/MWh and \$1,000/MWh for this initial exploration.

3. Please provide your organization's comments to the issues raised on fast-start pricing and feedback the CAISO should consider in preparation for the straw proposal. *

CESA strongly supports the incorporation of fast-start pricing methodologies to the markets administered by the CAISO

Fast-start pricing refers to policies or methodologies created to recognize that fast-start resources are the marginal resource used to meet the next increment of demand. Today, the two most commonly used fast-start pricing tools are minimum output limit relaxation and the inclusion of commitment costs into the locational marginal prices. In the Issue Paper, the ISO notes that it is willing to reassess its initial position regarding the need for fast-start pricing in the markets it administers. In this context, CESA welcomes the ISO's recognition that fast start pricing could result in prices that more accurately reflect system marginal costs in a regional market context.

The exclusion of fast-start pricing in the markets the ISO administers creates significant market inefficiencies and fails to provide the adequate incentives for maximizing the use of cleaner, lower cost resources that can displace costly thermal peakers. As noted by Powerex and the Public Power Council (PPC), the ISO's exclusion of fast-start pricing has required development of a framework of side-payment structures that not only distort the markets as they fail to properly account for the real cost of serving California's load, but also effectively subsidize a subset of polluting thermal peakers.² By using side-payment frameworks to compensate for minimum run time and start-up costs, the ISO effectively allows these assets to be dispatched as if they had significantly lower marginal costs, resulting in overreliance on these resources. If, alternatively, these assets had all of the aforementioned costs reflected within their marginal costs, the ISO market optimization would seek to minimize their use, a desirable goal that aligns with ratepayer interests and decarbonization efforts. Instead, the current exclusion of fast-start pricing continues to keep Californians dependent on costly peakers by overutilizing them and allowing them to be made whole because of the fact that their dispatch was not driven solely by marginal costs.³ The lack of fast-start pricing has required such a reliance on side-payments structures, such that BCR mechanisms are almost exclusively

² Powerex and PPC, "The Importance of fast-Start Pricing in Market Design: Including the Cost of Starting and Operating Natural Fast Peaking Units in Wholesale Market Prices", June 2022, at 12. Available at: <http://www.caiso.com/InitiativeDocuments/Powerex-and-Public-Power-Council-Report-Importance-of-Fast-Start-Pricing-in-Market-Design.pdf>

³ *Ibid*, at 13.

used for this purpose,⁴ despite the fact that other resource classes could benefit from reforms to this mechanism, as explored in CESA's answer to Question 4 of these comments.

In this context, CESA strongly supports the incorporation of fast-start pricing methodologies to the markets administered by the ISO. This being said, CESA is aware of the ISO's concerns surrounding the potential for infeasible dispatch instructions as a result of the interactions between fast-start pricing and the ISO's FRP dispatches. As such, CESA recommends the ISO prepare an overview of these concerns, the potential issues that could occur, and any and all examples that could inform the discussion surrounding how best to incorporate fast-start pricing without hindering the current optimization process. Moreover, CESA urges the ISO to build upon the analyses produced by Powerex and PPC in order to enable stakeholders to provide substantial feedback regarding the definition of fast-start resources and its application in either both the day-ahead and real-time markets or solely in the latter. To this effect, CESA recommends the ISO collaborate with Powerex, PPC, and their consultants to estimate the price impacts of defining fast-start resources as either 30- or 60-minute start resources. At this time, CESA does not consider that any resource class should be excluded from the analyses. As noted above, these analyses should also estimate the impacts of applying fast-start pricing in either both the DA and RT markets or only the RT market.

4. Please provide your organization's comments to the issues raised on the real-time market's multi-interval optimization, focusing on interaction with energy storage resources, and related changes to real-time bid cost recovery, and feedback the CAISO should consider in preparation for the straw proposal. *

CESA supports the CAISO exploring a weight methodology to mitigate concerns related to multi-interval optimization for storage resources

In the Issue Paper, the ISO notes that, today, its market dispatches resources optimally across a single financially binding 5-minute interval and 12 additional advisory 5-minute intervals in the RT market. Importantly, this optimization includes identical weighting for each market interval. This process is called multi-interval optimization (MIO). In previous initiatives, stakeholders have underscored that MIO has resulted in uneconomic dispatch instructions for energy storage resources. Particularly, stakeholders have highlighted that MIO might prematurely discharge or unduly charge a resource in anticipation of the prices estimated over the next 12 advisory intervals, resulting in suboptimal dispatch instructions for the binding interval.

After being tangentially raised in both the Resource Adequacy (RA) Enhancements and Energy Storage Enhancements (ESE) initiatives, CESA appreciates the ISO's consideration of this issue within the present initiative. As the Issue Paper acknowledges, some of the market participants with the most significant experience managing energy storage assets within ISO's footprint have underscored how MIO has materially affected their operations and expected revenue streams, complicating their bidding strategies and, more importantly, resulting in dispatch instructions that do not align with the ISO's reliability objectives. In this context, three proposals are posed for consideration:

- Option 1: Removing/making optional MIO for energy storage resources.
- Option 2: Placing different weights across the binding and advisory intervals considered in MIO.

⁴ *Ibid*, at 12.

- Option 3: Mitigate the impacts of uneconomic dispatch associated with MIO by awarding BCR so that the resource is made financially whole in the real-time market if it is dispatched uneconomically in real-time.

CESA does not believe that Option 1 is desirable, as it would lead to a disparate treatment of resources within the ISO optimization, and it may yield more reliability and operational concerns than it solves. Option 2, on the other hand, is promising and should be pursued immediately. To this end, CESA recommends the ISO collaborate with experienced market participants to identify examples that could be used to test a series of what-if scenarios with different weights applied across the binding and advisory intervals. These examples should keep bidding equal across all cases to easily identify the effects of the applied weights. The cases should explore scenarios in which:

- Only the binding interval receives a higher weight, and all advisory intervals are weighted equally.
- The binding interval is weighted higher, and the early advisory intervals receive a higher weight relative to the later advisory intervals.

Regarding Option 3, CESA considers that this approach should be considered in conjunction to the ISO's revision of fast-start pricing rules. As noted in our response to Question 3 of these comments, BCR has been largely utilized to make whole a single resource class due to the lack of fast-start pricing within the ISO's markets. Insofar as the ISO is able to revise fast-start pricing rules, it will be able to modify the BCR so that it may be readily applicable to make whole all resource classes, not just thermal generators. As such, CESA considers that Option 2 might be better suited for immediate development and refinement while Option 3 should be developed in conjunction to fast-start pricing rules.

5. Please provide your organization's comments to the issues raised on the market power mitigation grouping methodology and feedback the CAISO should consider in preparation for the straw proposal. *

CESA offers no comments at this time.

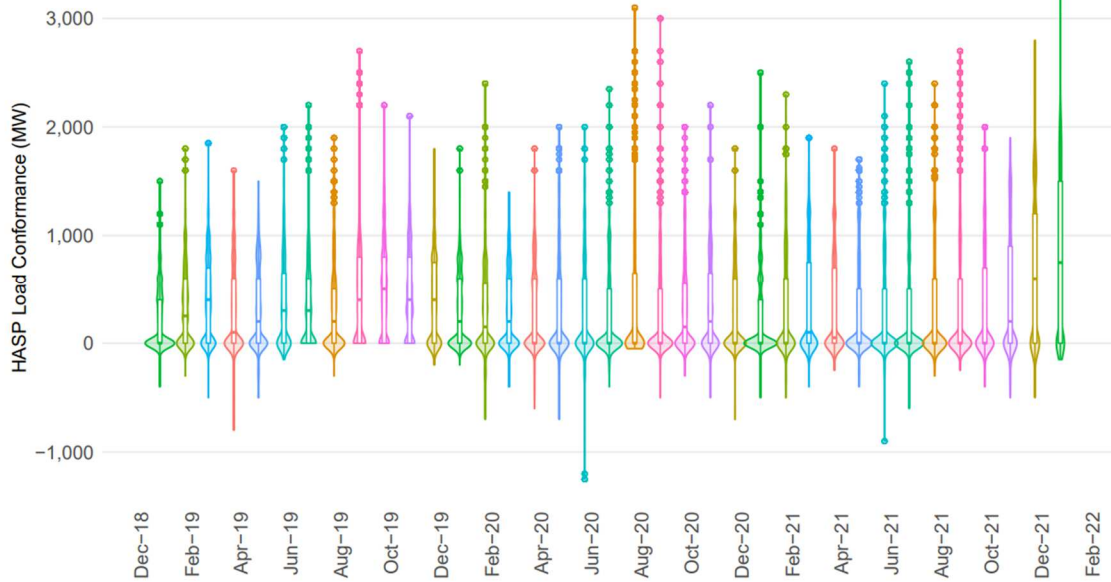
6. Provide any additional comments on the issue paper, or any additional scope items your organization feels should be included for this initiative. You may upload examples and data using the "attachments" field below:

CESA request considering the use of load conformance in the RT markets as part of the scope of the present initiative

As noted in our response to Question 2 of these comments, CESA is concerned with the routine use of load conformance in the RT market by the ISO as a means to mitigate what appears to be a systematic under-scheduling of load on behalf of load serving entities within the DA market. Load conformance effectively modifies the final load requirement the RT markets need to clear against supply. A positive conformance effectively increases the load requirements and will alter the overall market solution. According to a March 2022 report by the CAISO, load conformance overall tends to be positive and have a larger magnitude in the hour-ahead scheduling process (HASP),⁵ where positive conformance has reached values as high as 2,000-3,000 MW, as shown in Figure 1.

⁵ CAISO, "Load Conformance Impact on the Resource Sufficiency Evaluation", March 2022, at 8.

Figure 1. Monthly trend of historical HASP conformance⁶



CESA acknowledges that load conformance is an essential tool available to the ISO to provide the market signals necessary to retain reliability. Nevertheless, the fact that these tools are available does not imply that they should be needed with the frequency and magnitude they are currently used. The usage of load conformance paired with the misaligned LSE incentives that the ISO alludes to in its discussion of scarcity pricing within the Issue Paper warrant consideration of means to mitigate systematic under-scheduling of load and its effects on pricing. Thus, CESA request considering the use of load conformance in the RT markets as part of the scope of the present initiative.

⁶ *Ibid*, at 9.