



**Comments of the California Energy Storage Alliance (CESA) on
Energy Storage and Distributed Energy Resources Phase 4
Second Revised Straw Proposal**

Submitted by	Organization	Date Submitted
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I. Opening comments

CESA thanks the CAISO for its leadership and thought-work in this and previous ESDER initiatives.

In these comments, CESA highlights several key issues or points for the CAISO's consideration.

First, the costs of associated with incremental cycling of an energy storage asset, particularly in cases of cycling above and beyond what was anticipated and embedded in operational plans and related warranties, must be represented in CAISO dispatch or bid-calculations, where appropriate. The CAISO notes that many energy storage systems are contracted and assumed to perform one cycle per day.¹ CESA agrees that the cost and operational implications (*i.e.* degradation) of some expected cycling behavior may generally be captured and integrated in warranty agreements and or in in the market participation and bidding models used by resources. Additionally, operators and developers alike universally agree that most storage assets *can* cycle more than once per day and *would be willing to do so if incremental operation costs were covered by the revenues*. Currently, the CAISO's SIBR system does not allow for the differentiation of cycles within its bids; that is, it does not allow asset operators to provide information on whether a particular dispatch is associated with that assets first or Nth cycle. CESA believes that this option should be added in this initiative, as it would support more efficient cost-based dispatch and subsequent use of assets, in addition to fair compensation for incremental cycling, even if market mitigation is applied. To alleviate this

¹ "ESDER Second Revised Straw Proposal", CAISO, February 24, 2020, pg. 15.

deficiency, the CAISO should create a field in the SIBR platform to allow asset managers or scheduling coordinators to indicate different bids associated with each of the potential number of cycles. This, through the DA market, will ease the optimization of expected dispatches and efficiently use all available resources. The alternative is that resources may seek to limit excess dispatch through economic offers, which can be a blunt signal in some cases.

Second, CESA continues to oppose any implementation of a minimum charge requirement (MCR) in the ESDER initiative. Such a concept was not included in scope, and was not added until the Second Revised Straw Proposal. Further, the MCR has serious ramifications and needs further vetting, including from the Market Surveillance Committee, due to the potential implications of market inefficiency, uplift, frequency of this form of an exceptional dispatch, and interplay with capacity planning rules. CESA greatly appreciates that the CAISO may have operational concerns about storage resources carrying more of the CAISO load, and we should discuss these matters in a pre-scoped formalized process, with all applicable stakeholders involved.

Third, CESA supports the addition of state of charge (SOC) controls into the non-generator resource (NGR) model. These controls, particularly if designed flexibly (e.g. a 'minimum SOC parameter') will make the NGR model operate more effectively.

Fourth, CESA supports the creation of prudently designed default energy bids (DEBs). The above-mentioned 'incremental cycling cost' concept will be important in the establishment of DEBs. CESA generally supports multi-point DEB calculations to ensure efficient dispatch of storage, while also ensuring costs are always covered by DEBs (e.g. ensure 'fat' in any DEB calculation).

Finally, CESA believes further investigations into the treatment of real-time bids within the NGR scheme is appropriate. As real-time bids are typically adjustments off of day-ahead financial schedules, the implications of a 'spread' in real-time may be dependent on day-ahead awards, day ahead fuel-costs, e.g. charging schedules, and other factors. This may complicate the cost implications of real-time dispatches based on non-binding forward intervals, e.g. advisory RTM intervals two through seven, etc. CESA seeks an opportunity to evaluate examples of RTM dispatches in order to evaluate the extent that costs are recovered, as well as if the RTM market is properly incentivizing the provision of flexibility through marginal cost spread bids in RTM.

II. Comments to CAISO COMMENTS RESPONSE TEMPLATE

1. Demand Response (DR) ELCC Study Preliminary Results

Please provide your organization's feedback on the Effective Load Carrying Capability (ELCC) study preliminary results for DR resources, as discussed during the March 2 (day 1) stakeholder meeting. Please explain your rationale and include examples if applicable. Please also include any additional study results that would be helpful on this topic.

CESA supports efforts by the ISO, along with Energy + Environmental Economics (E3), to estimate the individual and combined capacity contributions of DR resources for purposes of long-term planning. Such efforts can be informative and should inform strategies for a future with increased reliance on energy and use-limited resources. The CAISO should also clarify where and how its energy markets drive resource performance, where its capacity studies highlight load-duration curves and needs in some electrical areas or

zones, and where State jurisdictional considerations should govern treatment of such assets, e.g. capacity counting.

To support these efforts, CESA offers two useful improvements or alternatives to consider in resolving the 'matching issues' E3 shared during the 3/2/20 stakeholder meeting: 1) an expanded horizon and pool for day-matching; and, 2) weather-matching considering similar days only (*i.e.* weekdays or weekends). CESA believes these tweaks to the analysis could help work-around or address issues mentioned by E3 given the lack of data clarity within their study. Thus, considering several day- and weather-matching methodologies, like the ones used to determine baselines for automated DR assets, could be valuable for the purposes of this study.

2. Operational Processes and Must Offer Obligations for Variable-Output DR

Please provide your organization's feedback on the proposed operational processes and must offer obligations for variable-output DR, as described within the second revised straw proposal. Please explain your rationale and include examples if applicable.

CESA offers no comments at this time.

3. End-of-Day State of Charge

Please provide your organization's feedback on the proposed end-of-day state of charge, as described within the second revised straw proposal. Please explain your rationale and include examples if applicable.

CESA believes the ISO's proposal to apply an end-of-day (EOD) state of charge (SOC) parameter is well-intentioned as it seeks to provide further certainty on the expected operations of the resource during said day, as well as its expected SOC at the beginning of the subsequent day. Furthermore, CESA supports the CAISO's determination to make this parameter optional, thereby increasing the operational toolkit available to energy storage asset schedulers.

Nevertheless, and considering the analysis carried out and shared by the ISO on the matter, CESA considers that setting this requirement to a high value (*e.g.* 75%) could result in uneconomic behavior that could, in fact, bolster the reliability risks associated with the need for fast-responding flexibility in the sunset hours and the eventual need for outsized energy arbitrage in order to cover the evening peak. The ISO showed during the stakeholder meeting and on page 11 of the Second Revised Straw Proposal that the establishment of any level of minimum SOC by the end of a given day could result in energy storage assets limiting output during the evening and eventually charging in the last three to two hours of the day. Such behavior is contrary to what the ISO and other regulators desire from energy storage resources in the future, since the ISO is expecting storage assets to absorb solar energy during the day, provide ramping capacity during the sunset hours, and discharge almost fully at night to cover the evening peak. Given the growing roles and importance in price-responsive scheduling and energy shifting from energy storage resources of any technology, CESA believes that a parameter or requirement that significantly inhibits these actions should not be pursued. CESA suggests that, instead of this proposal, the ISO consider furthering its use of market signals in the form of prices and bid limits (*i.e.* bid caps and floors) to encourage the behavior it desires from these assets. Any static limitation would only result in the hindering or complete

elimination of the flexibility storage resources are capable of offering; thus, such measures prove contrary to both reliability efficient operation of the system.

4. End-of-Hour State of Charge

Please provide your organization's feedback on the proposed end-of-hour state of charge, as described within the second revised straw proposal. Please explain your rationale and include examples if applicable.

CESA supports the establishment of an optional end-of-hour (EOH) SOC parameter. This functionality would enable stakeholders to maintain a desired SOC for future intervals and to participate more fully in energy and ancillary service markets. In so doing, the CAISO should continue to use the ancillary services schedule of the asset operator as the most binding parameter when applying EOH SOC restrictions. While CESA is supportive of this proposal, we have two concerns: 1) its application for intervals before the EOH SOC has been included; and, 2) with regards to the elimination of bid cost recovery.

First, CESA would like to highlight to the ISO that, since energy storage resources could experience differences in their scheduled (day-ahead (DA)) and actual (real-time (RT)) dispatches, the application of the EOH SOC parameter within the RT market run could be perceived differently in each market run. The ISO recognizes this challenge in the Second Revised Straw Proposal, and proposes to have an SOC requirement applied in the last applicable advisory within the 15-minute market run (*i.e.* the RTPD). This, in turn, results in the ISO proposing to have an implied SOC parameter in the first RT advisory interval that corresponds to the second to last advisory interval of the RTPD. CESA believes that this proposal is well intentioned; nevertheless, it is possible that asset owners that opt to include an EOH SOC parameter would suffer from extreme deviations from their DA schedule if the implied SOC appears that close to the end of the hour. Thus, CESA suggests the ISO consider including implied SOC parameters up to one RTPD interval before the end of the hour. That is, have linearly declining implied SOC parameters for all 5-minute intervals starting 30 minutes before the end of the hour (*i.e.* implied SOC parameters would occur first in the second to last RTPD advisory interval). CESA believes this option would allow for smoother compliance with the desired SOC, thus minimizing spikes in prices and operations even in situations where a vast amount of storage resources is online and has selected this feature.

Second, CESA urges the ISO to reevaluate their proposal to eliminate bid cost recovery (BCR) for the hours with an EOH SOC. CESA understands that the spirit of this proposal is to eliminate the need to "make whole" assets that have opted to potentially be dispatched uneconomically to comply with the selected parameter. Nevertheless, the proposal may poorly reflect the operations of energy storage in CAISO markets which differ from thermal resources which have less variable fuel costs, regardless of DA schedules. Fundamentally, the ISO's 'no-make-whole' approach is 'thermal-centric' insofar as it does not capture the temporal fuel-costs and complexities of storage. If a resource opts into an EOH SOC parameter, the main implications for it would be to avoid dispatch and charge at potentially uneconomic prices relative to their DA preferences. Nevertheless, the financial gains from such activity occur later, not in the interval when the EOH SOC has been enforced. For example, a 100 MWh resource has been dispatched and, at 8:45 am, is at 10 MWh. This resource has selected a 80 MWh EOH SOC for the hour ending 10 am. Under the ISO's proposal, the resource would be unable to benefit from BCR from 9:00 to 10:00; however, the resource would start trying to meet (maybe uneconomically) its EOH SOC parameter since 8:45 and it would not perceive revenues

from discharge until it has met said parameter. Thus, the costs associated with this charging behavior could precede the specified hour while the benefits or revenues associated with the same charge could occur after the specified hour. That is, the elimination of bid cost recovery would not affect the gains of the asset, as they would occur in any interval other than the one with the EOH SOC constraint. Hence, CESA recommends the ISO exclude this provision, as it may be unnecessary or create inappropriate under-recovery given the method of participation and operation of storage assets.

5. Default Energy Bid for Storage Resources

Please provide your organization's feedback on the proposed default energy bid for storage resources, as described within the second revised straw proposal. Please explain your rationale and include examples if applicable.

CESA commends the ISO for its work on developing a sound methodology for the establishment of default energy bids (DEBs) for energy storage resources. CESA understands that CAISO's intent with this proposal is to timely establish DEB calculations tools and systems that would be applied when storage resources represent a sufficient share of the overall system and or when they could potentially exert market power in particular areas or portions of the CAISO footprint.

While CESA acknowledges the CAISO's solid work to identify the likely array of determinant variables that should inform a DEB methodology, we note industry stakeholders have shown consistent concerns regarding the accuracy of any represented cycling costs. Hence, CESA's comments on this section focus on that factor.

During the stakeholder meeting, CESA noted that the CAISO is willing to incorporate the costs associated with cycles incremental to one daily cycle in their structuring of DEBs. CESA supports this measure, as it would allow resources to bid their true marginal costs. The use of true marginal costs would in turn lead to the optimal dispatch of assets, rewarding those that can comply with schedules and ease real-time needs at the lowest costs. Hence, as stated in our opening comments, CESA urges the ISO to further the implementation of multiple cycle cost modeling in areas beyond the development of DEBs.

6. Minimum Charge Requirement

Please provide your organization's feedback for inclusion of the minimum charge parameter in the ESDER initiative, and feedback on presented material at the stakeholder meeting on March 3, 2020.

CESA strongly opposes the minimum charge requirement (MCR) that was previously added to and proposed in the RA Enhancements initiative and has now been included in the present Second Revised Straw proposal. While CESA understands the CAISO's general reliability intent underwriting for this proposal, this proposal may (1) create inefficient markets (2) embed a type of exceptional dispatch into markets (3) hinder market participation; (4) increase reliability risks by constraining flexible RA supply; and, (5) potentially discriminate against storage resources thus running afoul to both CAISO and FERC policy. CESA elaborates below:

First, the proposal will embed a system of deviating a unit's dispatch from its economically-indicated preferences. This creates market inefficiency. Why would the CAISO use this approach when price-signals could be used, particularly given the very low penetrations of energy storage in the CAISO market? The CAISO should generally seek to use price-signals to drive behavior and trust its market. It may be that future prices look different from today's, and that the CAISO's reliability concerns may not play out. CESA has recommended the CAISO consider how energy pricing might work in a full 'renewables and storage' scenario. The concept of gas-based marginal-unit pricing may not fully apply to this future, and exploration of pricing approaches to drive outcomes may be useful. CESA does not dispute that energy limited resources are, in fact, energy limited and so cannot singularly run under some conditions, but resources like energy storage can charge and ramp quickly, and pricing could drive such actions.

Second, operator-directed actions, such as embedded exceptional dispatches based on future expected conditions should be used only infrequently and should not be used *de rigueur*. CESA does not dispute the need for CAISO operators to exceptionally dispatch units in rare reliability instances.

Third, CESA believes that the MCR could significantly strand the capabilities of storage assets by forcing them to sit idle; thus, foregoing revenues from markets aside the energy market. This policy would not only hurt current energy storage, it could in fact hinder the financing available for future projects, increase procurement costs as revenues may decline, and ultimately hurt ratepayers due to suboptimal utilization of assets.

Fourth, CESA believes it is evident that a policy designed to have storage assets hold off their charge to provide energy arbitrage to contribute to the evening peak would limit these assets' ability to quickly respond to the flexible and ramping needs the ISO faces daily as the sun sets. By forcing the most responsive resources in the grid to sit out the sunset ramp, the CAISO would be hindering the reliability of the electric system today and in future years. *To wit*, the CAISO recently commented during the Senate Bill (SB) 100 Inputs and Assumptions Workshop that they expect a 25 GW need of flexible ramping capacity by 2030 (February 24, 2020). The ISO, being aware of this colossal requirement, should not establish rules that may at times limit the availability or effectiveness of flexible ramping capacity. It is contrary to the CAISO's mandate to adopt policies that jeopardize the reliability of the electric service in its footprint.

Lastly, CESA considers that this unduly restrictive approach is discriminatory as it establishes requirements and limitations that are only applicable to a subset of resources: storage assets. CESA sees the MCR as a market barrier to storage assets, a barrier that has not been placed for conventional thermal generators or any other technology within the CAISO footprint. Discrimination of this types may be in violation of FERC's directives for non-discriminatory energy markets.

For all these reasons, CESA urges the CAISO to forego this proposal and instead focus on the effective use of market signals to incent the desired behavior of assets. Energy storage technologies are perfectly positioned to provide a wide array of grid services in a responsive and efficient manner. The ISO has the ability to use their price signals to unlock and fairly reward this potential. Instead of limiting these resources, affecting their financeability and passing that bill to ratepayers, the ISO should focus on methods to better signal and compensate optimal participation and dispatch.

7. Additional comments

Please offer any other feedback your organization would like to provide from the straw proposal and topics discussed during the web meeting.

CESA would like to provide additional feedback on the use of spreads within RT market dispatch. During the stakeholder meeting, the ISO mentioned that it uses the DA-provided bid curve to determine when resources are set to charge and discharge within the RT market run. CESA considers this implementation, while optimal in the DA market, has adverse effects in the RT market. There is little transparency in how the CAISO's optimization algorithm uses the bid curve supplied by asset owners in the DA market for its RT dispatch. CESA believes this uncertainty should be clarified as currently it seems the RT market optimization considers only the bid spread and not the entirety of the curve supplied by asset owners. As the RT market optimization horizon is shorter, the use of expected bids to determine charge and discharge patterns may affect the revenue stream of resources, especially considering this is done without regard to the complexities of cycles (*i.e.* the cycle number a resource is in), opportunity costs, and variable fuel-costs. Thus CESA maintains that the ISO should reevaluate this practice and avoid using DA-equivalent spreads within the RT market.