

Comments on Energy Storage Enhancements Second Revised Straw Proposal

Department of Market Monitoring

August 4, 2022

Summary

The Department of Market Monitoring (DMM) appreciates the opportunity to comment on the *Energy Storage Enhancements – Second Revised Straw Proposal*.¹

DMM supports enhancements that improve the availability of ancillary services awarded to energy storage resources, and the proposed enhancements to allow state of charge exceptional dispatch of energy storage resources. The current proposal to compensate state of charge exceptional dispatches for the opportunity cost of missed market opportunities improves upon the earlier proposed approach.

However, DMM requests clarification on a number of details of the revised counterfactual analysis used to calculate opportunity cost. DMM also requests clarification of some details of the proposed approach to account for the impact of ancillary services awards on expected state of charge, and suggests that the CAISO maintain the earlier proposed requirement for energy bids to accompany the full quantity of awarded ancillary services. Any requirement for energy bids to accompany awarded ancillary services should be in the opposite direction of the awarded ancillary service to ensure that the real-time market can dispatch the battery as needed to manage state of charge.

DMM supports enhanced tools to manage local area reliability needs. As an additional component of these enhancements, the CAISO should also consider ways to address the potential for unmitigated local market power that may result during charging of a storage resource needed for local reliability.

DMM does not oppose the proposed enhancements for co-located resources. However, DMM believes it would be far more efficient to reflect tax implications of grid charging in energy bids rather than by limiting the ability charge from the grid. Further, co-located storage resources that are restricted to charging from the output of co-located variable energy resources (VERs) are inherently less flexible and potentially less available in peak hours than storage resources that can charge from the grid at any amount. Therefore, it will be important that the CPUC's new slice-of-day resource adequacy framework and the CAISO's UCAP policy appropriately differentiate between the capacity contributions of the two types of storage resources.

¹ *Energy Storage Enhancements – Second Revised Straw Proposal*, California ISO, June 30, 2022:

<http://www.caiso.com/InitiativeDocuments/Second-Revised-Straw-Proposal-Energy-Storage-Enhancements.pdf>

DMM supports the CAISO's proposal to include an opportunity cost component in the day-ahead default energy bid (DEB). The CAISO has observed through operational practice that intraday opportunity costs may not be adequately reflected in the day-ahead market optimization when the DEB does not include opportunity costs. The explicit inclusion of opportunity costs in the day-ahead DEBs may help to preserve the consideration of opportunity costs in storage resource market awards when storage resources are mitigated in select hours of the day-ahead market.

Finally, DMM notes that the CAISO does not address the issue of bid cost recovery (BCR) that can result from differences in state of charge between the day-ahead and real-time markets. DMM continues to recommend that the CAISO consider mechanisms that could better align day-ahead and real-time state of charge levels, or that the CAISO consider other restrictions on bid cost recovery eligibility, to prevent unnecessary BCR payments or potential BCR gaming opportunities.

Comments

I. Reliability Enhancements

DMM supports market enhancements that improve the availability of ancillary services awarded to energy storage resources

In earlier comments, DMM discussed some of the issues around availability of ancillary services procured from energy storage resources.² The CAISO has also noted that a number of issues have been identified around the ability of storage resources to provide ancillary services to the market, and the feasibility of those awards between day-ahead and real-time. To address some of these issues, the CAISO proposes two enhancements in the second revised straw proposal:

- Model the estimated impact of regulation awards on state of charge, and
- Require all ancillary service awards for storage resources to be accompanied by bids for energy, up to 50 percent of the ancillary service award quantity.

DMM supports each of the proposed enhancements, but requests additional clarification on some elements. Further, the proposal to require energy bids to accompany ancillary service awards could be strengthened by retaining the earlier proposed requirement to have energy bids accompanying 100 percent of ancillary service award quantities. DMM notes that any requirement for energy bid range accompanying ancillary service awards should be in the opposite direction of the ancillary service to ensure accurate state of charge management by the market dispatch.

² *Comments on Energy Storage Enhancements Working Group*, Department of Market Monitoring, August 10, 2021: <http://www.caiso.com/Documents/DMM-Comments-on-Energy-Storage-Enhancements-Working-Group-Aug-10-2021.pdf>

DMM requests clarification of the proposed formula to model regulation awards impact on state of charge

The second revised straw proposal states that the state of charge for a storage resource is governed by the following formula:

$$SOC_{i,t} = SOC_{i,t-1} - (P_{i,t}^{(+)} + \eta_i P_{i,t}^{(-)})$$

Where

$SOC_{i,t}$	State of charge for resource i at time t
$P_{i,t}^0$	Charging (+) or discharging (-) instruction for resource i at time t
η_i	Round trip efficiency for resource i

The CAISO proposes to modify this formula as follows to reflect the estimated impact of regulation awards on state of charge:

$$SOC_{i,t} = SOC_{i,t-1} - (P_{i,t}^{(+)} + \eta_i P_{i,t}^{(-)} + \mu_1 RU_{i,t} - \mu_2 \eta_i RD_{i,t})$$

Where

$RU_{i,t}$	Regulation up awarded to resource i at time t
$RD_{i,t}$	Regulation down awarded to resource i at time t
μ	Multiplier

The text in the second revised straw proposal goes on to describe that the formula for state of charge at time t is a function of energy dispatch awards in the *previous* interval, and a fraction of regulation awards in the *previous* interval.³

DMM requests three clarifications related to the proposed formula, where the text description and DMM's understanding appears inconsistent with the mathematical representation:

1. Can the CAISO confirm that charging energy values would enter the formula as negative numbers, while discharging values would enter as positive values? If both values are positive, the signs in the formula appear inconsistent with the verbal description of the formula.
2. The parameter η representing round-trip efficiency is shown in the formula as associated with the discharge schedule at time t . However, the text – consistent with DMM's understanding – describes the round-trip efficiency parameter as associated with the charging schedule at time t .⁴ Can the CAISO confirm this error in the mathematical representation, and that the text description is correct?

³ Second revised straw proposal, pg. 8

⁴ Ibid

3. Can the CAISO confirm that the formula is describing end of interval (t) state of charge as a function of energy dispatch and regulation awards in the *current* interval (t), rather than the previous interval (t-1) as described in the text?⁵

The proposed approach to model the impact of regulation awards on state of charge could benefit from additional development to account for significantly different impacts at different times of the day

The CAISO's proposed approach to account for regulation awards in the state of charge depends on a multiplier, as described in the formula shown above. This multiplier appears intended to represent the typical impact of 1 MW of a regulation award at a given time on the state of charge. CAISO states that this multiplier will be specified in a business practice manual, and may be updated as the CAISO updates analysis of the actual impacts of regulation awards on state of charge. However, the second revised straw proposal provides no information on how this multiplier will be calculated initially or on an ongoing basis. DMM requests that the CAISO provide this information to clarify how the multiplier will be calculated.

Additionally, the proposed approach appears to rely on a static multiplier for each regulation type. This implies that the CAISO will estimate a constant impact of each type of regulation award on state of charge, regardless of time of day. This approach is likely to produce inaccurate results at times. For instance, regulation down awards in the middle of the day during peak solar production are likely to have a much greater impact on state of charge than a regulation down award in hour 19 or 20. DMM suggests the CAISO consider an approach that could more accurately reflect the varied impacts of each type of regulation award on state of charge at different times of day.

DMM supports the proposal to require energy bids for the range of regulation awards, but suggests that the CAISO maintain the earlier proposal of requiring real-time energy bids for the full quantity of regulation awarded day-ahead

DMM supports CAISO's proposal to require energy bids to accompany ancillary service awards. This requirement, when applied for energy bid range in the opposite direction of the awarded ancillary service, will ensure that resources with ancillary service awards can be charged or discharged by the market in real-time in order to ensure continued availability of awarded ancillary services capacity throughout the day. For example, a regulation up award with accompanying energy bids on the charging range of the resource will ensure that the real-time market can charge the battery as needed to maintain the regulation up capacity. Similarly, a regulation down award with accompanying energy bids on the discharging range of the resource will ensure that the market can discharge the battery as needed to maintain sufficient charging capability to support regulation down service.

⁵ Ibid

DMM encourages the CAISO to require energy bids to accompany 100 percent of ancillary service awards, rather than limiting to 50 percent as currently proposed. CAISO has offered no explanation for the revised proposal to only require energy bids for 50 percent of ancillary service awards. Requiring energy bids for 100 percent of ancillary service awards ensures that the market has maximum flexibility to move the resource to maintain ancillary service awards needed for reliability.

Some stakeholders have expressed that submitting energy bids to accompany ancillary service awards could lead to uneconomic dispatch of storage resources to maintain the ancillary service awards. DMM notes that because the ability of storage resources to provide ancillary services is dependent on state of charge, this is an outcome and a cost associated with storage resources providing ancillary services.

Under current market design, bid costs associated with uneconomic dispatch of storage resources associated to maintain ancillary services are considered in daily bid cost recovery calculations. This results in the cost of storage resources providing ancillary services being borne by measured demand through bid cost recovery allocation, rather than by the resource providing the ancillary services. If instead these storage resources faced the full cost of their ancillary services provision, they may be expected to reflect these anticipated costs in day-ahead ancillary services offers. This could result in a different resource mix providing ancillary services, or in different ancillary services clearing prices. However, such an outcome may be appropriate and efficient to the extent that it more accurately reflects the true costs of storage resources providing ancillary services.

DMM suggests that the CAISO could further enhance ancillary services functionality for energy storage resources by better aligning regulating limits used for these resources in the day-ahead and real-time markets

DMM has observed that some storage resources frequently have more limited regulating ranges in real-time than the values registered in the CAISO Master File which are used in the day-ahead market. When battery regulation limits change between the day-ahead and real-time markets, the real-time market may be forced – potentially uneconomically – to move a battery resource to an operating point at which day-ahead ancillary service awards remain feasible. If real-time regulation ranges cannot accommodate the full day-ahead regulation up and down awards, the real-time market may be forced to find regulation on other resources instead.

DMM suggests that if storage resource regulating ranges change frequently and if updated values are known in the day-ahead timeframe, then the CAISO could allow storage resources to update regulating ranges on a timelier basis and potentially at the hourly level. These updated values could be reflected in the day-ahead market, potentially aligning day-ahead regulating ranges better with real-time values.

Forcing charge or discharge on a resource in real-time to maintain ancillary service awards when regulating limits are more restrictive in real-time presents bid cost recovery gaming concerns and potential operational issues when resources must be backed off of day-ahead ancillary services and the CAISO must procure these reserves from other resources in real-time on short notice.

DMM continues to support enhancements to exceptional dispatch procedures for energy storage resources

The CAISO proposes to expand exceptional dispatch (ED) functionality for energy storage resources. The proposed new functionality would allow CAISO operators to issue exceptional dispatches (EDs) for energy storage resources on the basis of state of charge rather than megawatt instructions. DMM continues to support these proposed enhancements.

DMM has observed cases where batteries received ED instructions to charge significantly when the resources were already at or near a full state of charge. In some of these cases, resources could not feasibly meet ED instructions to charge. In other cases, these ED instructions caused batteries to discharge uneconomically prior to the ED to charge, in order to reduce the resource's state of charge to create headroom so that the resource could meet the charge instruction.

DMM has also observed cases where EDs issued as fixed megawatt instructions have caused ancillary service awards to become infeasible in real-time. In these cases, ancillary services must then be procured from other resources in real-time on short notice when the system may already be very constrained.

Exceptional dispatch instructions that do not consider existing state of charge can also drive inefficient outcomes. For example, such EDs can impact prices in earlier intervals if resources are forced to discharge out of economic merit to meet the ED, or may add charging demand on the system when it is not needed.

Based on these observations, DMM believes that the proposal to allow ED instructions as state of charge values for batteries will be a significant improvement to existing processes. Issuing EDs to batteries as state of charge values could help prevent ED instructions from being infeasible and could mitigate instances of resources being forced to either discharge or charge uneconomically to meet ED instructions. Issuing EDs as state of charge values could also allow batteries more flexibility to maintain existing ancillary service awards and could provide resources more flexibility to capture additional revenue opportunities before the time at which the CAISO determines it needs the resource to be at a specific level of charge.

CAISO has continued to improve the proposed compensation for resources for opportunity cost when exceptionally dispatched to hold state of charge, but the proposed approach needs additional clarification

The CAISO proposes to compensate energy storage resources for opportunity cost of missed market opportunities when exceptionally dispatched to hold state of charge. The concept of compensating this type of opportunity cost may be appropriate, and the CAISO's approach presented in the second revised straw proposal appears to be a further improvement over approaches presented in the earlier straw proposals. However, DMM requests additional clarification to ensure that the latest proposed approach represents a reasonable estimate of opportunity cost.

As DMM understands, the CAISO is proposing to optimize the charge and discharge of a storage resource exceptionally dispatched to hold state of charge over the period of the exceptional dispatch, plus a window of time following the exceptional dispatch. The proposed approach will use realized prices to produce two counterfactual examples with and without the exceptional dispatch. The CAISO then proposes to compensate the exceptionally dispatched resource for any profit foregone as a result of the exceptional dispatch, as indicated by the difference between the counterfactual profit calculations.

In the second revised straw proposal, the CAISO has improved the proposed approach by considering submitted energy bids when determining the profit maximizing dispatch used in counterfactual analysis. DMM supports this improvement. However, DMM requests that the CAISO confirm that energy bids are also considered when determining charging schedules in the counterfactual analysis. As with energy bids to discharge, the counterfactual solution will be invalid if it assumes charging occurs at certain times that may be profit maximizing in the context of market prices but do not consider energy bids in place at that time.

Additionally, DMM requests additional explanation of the counterfactual calculation presented in Table 1 on page 13 of the second revised straw proposal. In the portion of this calculation reflecting the profit maximizing outcome in the absence of exceptional dispatch, a charging schedule for -25 MW is shown at time 20:00.⁶ The LMP at this time is shown to be \$75/MWh. The text states that "we assume that the storage resource bids to discharge anytime prices are greater than \$50/MWh".⁷ Therefore, DMM would expect the schedule at 20:00 to be a discharge rather than charging schedule when the submitted energy bid is considered. While the profit maximizing dispatch given prices without considering submitted energy bids may be to charge at 20:00, this counterfactual is irrelevant in the proposed opportunity cost calculation. This outcome would not be realized given the submitted energy bids, and as such should not be considered in the calculation of opportunity cost.

⁶ See "Table 1: Exceptional Dispatch Compensation", second revised straw proposal, page 13.

⁷ Second revised straw proposal, page 13.

DMM supports enhanced tools to manage local area reliability needs and new forms of local market power

The CAISO uses “second tier constraints,” such as minimum online constraints (MOCs), to meet local reliability needs through day-ahead market processes. These constraints ensure commitment of resources for local needs, but are not priced in the market, and do not create energy schedules.

As the CAISO notes, energy storage resources are always committed and therefore meet the criteria to satisfy second tier constraints. However, unlike traditional resources, storage resources cannot generate when needed unless they are charged.

The CAISO proposes enhancements to the logic for second tier constraints to automatically secure state of charge (SOC) through day-ahead processes for energy storage resources needed for local reliability needs. As reliance on storage resources continues to grow, DMM supports these enhancements to ensure storage resources have sufficient SOC when needed to meet local reliability needs.

While DMM supports the proposed enhancement, the CAISO would need to consider local market power implications of creating charging schedules for storage resources that are part of an MOC or are otherwise needed for local reliability.

For the case of a traditional generator that is part of an MOC, market power concerns are somewhat mitigated by caps on commitment costs. However, energy storage resources do not have traditional commitment costs. When energy storage resources are required to charge to meet the need of an MOC or otherwise provide local capacity, energy bids to charge effectively become the cost of providing that commitment.

Storage resources that are required to charge to meet an MOC or other local reliability need could potentially exercise local market power by submitting very low charging bids. Although existing market power mitigation measures do not allow for mitigation that would raise bids to a level higher than those submitted, the CAISO should consider ways in which energy storage charging bids may be mitigated up to ensure competitive market outcomes when charging is required to meet local reliability needs.

II. Co-located Enhancements

Tax issues and enhanced co-located resource functionality

The CAISO proposes enhancements that would limit the dispatch charging instructions of co-located storage resources to the dispatch operating target of one or more co-located VERs, and allow deviation of the storage resource when the VERs are unable to produce the forecasted amount. The proposed changes would not be available by default, but would be electable by any co-located storage resource.

The CAISO proposes these changes to address stakeholder concerns that some co-located storage resources are limited in their ability to charge from the CAISO grid in order to maintain preferential tax treatment. The CAISO also states that a storage resource without sufficient SOC to discharge because the onsite VER was unable to produce enough to charge the storage resource should submit an outage card, which would be subject to RAAIM.

DMM continues to recommend that the CAISO and stakeholders develop a reasonable model for incorporating the investment tax credit (ITC) reductions into bids. This could be significantly more efficient than most co-located resources resorting to constraining themselves to never charge from the grid, and could represent a long-term solution available to all resources with such limitations now or in the future. However, the investment tax credit and property tax issues seem significant enough to discourage participation, and could even discourage investment in new storage resources, if the CAISO does not acknowledge them as costs or constraints in its dispatch instructions. Therefore, DMM does not oppose the provisions CAISO is proposing to promote resource development and allow some co-located storage resources to avoid charging from the grid.

Given CAISO's proposal to allow some co-located resources to elect to constrain themselves to never charge from the grid, it will be important that the CPUC's new slice-of-day resource adequacy framework and the CAISO's UCAP policy appropriately differentiate between the capacity contributions of the two types of storage resources.⁸ Storage resources that can never charge from the grid will be less flexible and less able to supply capacity at all critical hours than storage resources that can charge from the grid. Therefore, co-located resources that are constrained to not charge from the grid should receive a lower capacity payment than storage resources that can charge from the grid. If the CPUC slice-of-day framework and the CAISO's UCAP framework can appropriately discount the capacity values of co-located storage resources that will not charge from the grid, these resources will then be able to weigh the costs and benefits of choosing to limit their ability to charge from the grid.

Pseudo-tie resources functionality

The CAISO proposes to relax the existing requirement that pseudo-tied co-located resources show firm transmission for the full generating capability of the resources from the generator interconnection to the CAISO delivery point. The CAISO then proposes to use the aggregate capability constraint (ACC) to ensure that the aggregate market dispatch of the pseudo-tied co-located resources does not exceed the interconnection limits and firm transmission associated with the project. DMM does not oppose this change, which appears to better align firm transmission requirements for co-located resources with generator interconnection limits.

⁸ CAISO estimates in the revised straw proposal that the provisions to prevent grid charging would go into place in 2023. This timeframe could extend into new resource adequacy structures that are currently under development.

III. Addendum to revise day-ahead DEB for energy storage resources

DMM supports the CAISO's proposal to introduce an opportunity cost component to the day-ahead DEB for storage resources

DMM supports the CAISO's proposal to introduce an opportunity cost component to the day-ahead DEB for energy storage resources. The application of market power mitigation to only a portion of a day-ahead bid set appears to change the day-ahead bids for a mitigated storage resource such that the optimization may no longer consider intraday opportunity costs. DMM agreed with the CAISO's earlier conclusion that the timeframe of the day-ahead market may be sufficient to consider intraday opportunity costs. However, DMM also noted that explicit inclusion of opportunity costs may be needed where costs are otherwise not considered by the CAISO market optimization.⁹

The existing day-ahead DEB for storage resources does not include an opportunity cost component, based on the theory that explicit inclusion of intraday opportunity cost is not necessary when resources are optimized over a full 24 hour period. As the CAISO has noted observing in practice and explained more below, this theory does not hold when the underlying assumptions of the daily bid set for the storage resource are violated.

The Market Surveillance Committee (MSC) described in its September 9, 2020 opinion on ESDER 4 the conditions under which this outcome holds.¹⁰ These conditions include a range of potential bid sets including one with a static value reflecting only the marginal cost of cycling for discharge and \$0 for charging (the "purist approach"), and another that explicitly includes the full opportunity and other marginal cost as applicable for each hour, if day-ahead prices are well estimated *a priori*.¹¹ DMM has also previously noted that while perhaps unnecessary in some situations, explicitly including well-estimated opportunity costs in day-ahead bids is unlikely to have a detrimental impact to the efficiency of dispatch.¹²

It is important to note that individual bids in each hour are part of a complete daily bid set that can result in the profit maximizing outcome over the day. Changing the bids in one hour can impact the market solution for a storage resource in subsequent hours. Therefore, while a given bid that does not explicitly include opportunity costs may lead to the optimal dispatch of

⁹ *Stakeholder Comments: Energy Storage and Distributed Energy Resources (ESDER) – Storage Default Energy Bid -- Draft Final Proposal*, Department of Market Monitoring, October 9, 2020.

<http://www.caiso.com/Documents/DMMComments-ESDER4StorageDefaultEnergyBidDraftFinalProposal-Oct92020.pdf>

¹⁰ *Opinion on Energy Storage and Distributed Energy Resources Phase 4*, Members of the Market Surveillance Committee of the California ISO, September 9, 2020. http://www.caiso.com/Documents/MSC-OpiniononEnergyStorageandDistributedResourcesPhase4-Sep8_2020.pdf

¹¹ *Ibid*, pg. 13 and 26-29

¹² See pg. 4, footnote 3: *Stakeholder Comments: Energy Storage and Distributed Energy Resources (ESDER) – Storage Default Energy Bid -- Draft Final Proposal*, Department of Market Monitoring, October 9, 2020.

<http://www.caiso.com/Documents/DMMComments-ESDER4StorageDefaultEnergyBidDraftFinalProposal-Oct92020.pdf>

a storage resource when used in the context of a broader optimal bidding strategy, this bid may not lead to the same market outcome if used individually outside of that context to replace a selected hour of a market bid. This is the case of local market power mitigation, where a DEB may replace a market bid for select hours, but unmitigated bids in other hours may be inconsistent with the optimal day-ahead bidding strategy from which the DEB is derived.

When energy storage resources are subject to local market power mitigation and have market bids replaced with DEBs in select hours, it cannot be assumed that the resulting bid set will lead to the optimal dispatch of the resource, or reflect intraday opportunity cost associated with the optimal dispatch in the mitigated hours. The bid set combining mitigated bids and the remaining unmitigated market bids may not be consistent with the daily profit maximizing bid strategy that produced the DEB. Only when the full days' day-ahead bids conform to the necessary assumptions can this outcome be assumed without explicit inclusion of opportunity costs in all hours.

In order to preserve the consideration of intraday opportunity cost associated with the optimal dispatch in the day-ahead mitigated bid set, this cost should likely be explicitly included in the day-ahead DEB. Intraday opportunity cost for the specific resource and market run will be determined by the daily bid set, comprised of both mitigated bids and unmitigated market bids. Therefore, explicit inclusion of this opportunity cost in a DEB will not consider opportunity costs in the context of the submitted bid set for the resource. However, a DEB constructed in this way will reflect an estimate of intraday opportunity costs for that hour as would occur if the resource had bid in all hours of the day to achieve the profit maximizing dispatch solution over the day. This should be an appropriate basis for a cost-based DEB.

The CAISO's proposed approach to including opportunity cost in the day-ahead storage DEB is likely to improve the existing day-ahead storage DEB, and to improve the ability of the day-ahead market to accurately reflect intraday opportunity costs for storage resources when mitigated. However, DMM continues to recommend that for both the day-ahead and real-time energy storage DEBs, the CAISO consider a more precise estimate of hourly opportunity cost that can reflect changing opportunity costs throughout the operating day.

IV. Additional changes

DMM continues to recommend that the CAISO consider mechanisms to prevent unnecessary BCR and potential BCR gaming opportunities

In earlier comments, DMM expressed concern that significant deviations between day-ahead and real-time state of charge values can create opportunities for potential gaming of bid cost recovery payments.¹³ The CAISO does not address this issue in the revised straw proposal.

DMM continues to recommend that the CAISO consider mechanisms that could better align day-ahead and real-time state of charge levels, or add additional restrictions on bid cost recovery that could be related to differences between real-time state of charge and day-ahead market state of charge.

Early in the ESDER stakeholder processes, DMM recommended the CAISO consider the implications of a day-ahead submitted state of charge as a new and unique intertemporal constraint between markets.¹⁴ DMM recommended that the CAISO revisit this topic in future initiatives to address potential settlement implications. DMM remains concerned about potential BCR gaming opportunities related to batteries reaching state of charge limits at different intervals in real-time markets than in the day-ahead market. These issues are exacerbated by a battery having a different initial state of charge in real-time than day-ahead, but they can arise even if the initial state of charge values are identical.

In light of the significant and growing volume of battery resources in the CAISO market (and payment of BCR for these resources), DMM recommends that the CAISO consider enhancements to avoid unnecessary BCR and mitigate potential gaming opportunities related to state of charge limitations.

¹³ *Comments on Energy Storage Enhancements Working Group*, Department of Market Monitoring, August 10, 2021: <http://www.caiso.com/Documents/DMM-Comments-on-Energy-Storage-Enhancements-Working-Group-Aug-10-2021.pdf>

¹⁴ *Stakeholder Comments: Energy Storage and Distributed Energy Resources (ESDER) – Revised Draft Final Proposal*, Department of Market Monitoring, February 2, 2016. <http://www.caiso.com/InitiativeDocuments/DMMCommentsEnergyStorageDistributedEnergyResources-RevisedDraftFinalProposal.pdf>