Energy Storage and Distributed Energy Resources (ESDER) Phase 3

Draft Final Proposal

Comments by Department of Market Monitoring

August 3, 2018

I. Overview

DMM appreciates the opportunity to comment on the ISO's *Energy Storage and Distributed Energy Resources Phase 3 (ESDER3) Draft Final Proposal*. DMM supports various components of the ISO's proposal, including hourly block and fifteen minute dispatchable bid options for resources that cannot respond to real-time dispatch. The ISO's proposed bid options should provide an effective tool for scheduling coordinators to prevent infeasible 5-minute dispatches for certain DR resources.

DMM remains concerned about the ISO's reliance on the Commitment Costs and Default Energy Bid Enhancements (CCDEBE) policy to alleviate some stakeholder concerns related to demand resource (DR) scheduling. The ISO has communicated to stakeholders that the CCDEBE policy will enable DR to bid non-zero commitment costs to help manage RUC commitment and infeasible real-time dispatches.[1] The CCDEBE proposal was approved by the ISO Board in March, but omitted key details regarding proxy costs for DR resources. These proxy costs are necessary for calculating commitment cost caps. DMM detailed these concerns in comments on the *CCDEBE Revised Draft Final Proposal*.[2] The ISO should address the CCDEBE proposal's shortcomings related to DR before DR is permitted to bid non-zero commitment costs.

DMM supports the concept of a behind-the-meter (BTM) participation model that allows resources to both supply and consume. While the ISO's proposed Load Shift (PDR-LSR) model would provide BTM resources with these options, designing the PDR-LSR model within the existing PDR construct with added constraints could be limiting for future DER integration. Entirely new, more flexible participation models could be better suited for integrating diverse DERs and aggregations in the future.

DMM encourages the ISO to explore new DER participation models that could explicitly reflect varying resource configurations. For example, a multi-stage generator (MSG) type model could

[1] See *Energy Storage and Distributed Energy Resources Phase 3 Revised Straw Proposal*, California ISO, April 30, 2018, p. 9: http://www.caiso.com/Documents/RevisedStrawProposal-EnergyStorage-DistributedEnergyResourcesPhase3.pdf

[2] See *DMM Comments on Commitment Cost and Default Energy Bid Enhancements Revised Draft Final Proposal*, DMM, February 28, 2018, p. 23: http://www.caiso.com/Documents/DMMComments-CommitmentCostsandDefaultEnergyBidEnhancementsRevisedDraftFinalProposal.pdf

better accommodate diverse aggregations that may contain more than two metered assets. This type of model could also help scheduling coordinators better reflect resource costs if each configuration's physical parameters and costs are modeled explicitly in the market.

Though the ISO has removed NGR model enhancements from the ESDER3 initiative, DMM also encourages the ISO to continue working with stakeholders to identify limitations of existing storage models and where costs or constraints faced by storage resources could be more efficiently reflected in these models. Some stakeholders have suggested that because NGR resources are not subject to mitigation today, commitment costs can be recovered through energy bids. This reasoning should not be considered sustainable – should NGR resources be subject to mitigation in the future, non-marginal costs that stakeholders reflect in energy bids would not be included in default energy bids used in market power mitigation processes.

In comments below, DMM expresses support for various parts of the ISO's ESDER3 proposal and flags components of the ISO's proposal requiring additional detail or clarification. DMM also discusses potential enhancements to DER and storage participation models that could support more efficient market participation in the future.

II. New bid options for demand response resources

DMM supports the ISO's proposal to offer hourly block and 15 minute dispatchable bid options for certain DR resources.

DMM supports the ISO offering hourly block and 15 minute dispatchable bid options for resources that cannot respond to real-time dispatches. The new bid options should provide an effective tool for scheduling coordinators to prevent infeasible 5-minute dispatches for certain DR resources.

The ISO should allow any type of resource that cannot respond to five minute dispatch to qualify to use the less flexible bid options being proposed. DMM has confirmed that other types of resources including some wind and solar resources have difficulty responding to 5 minute dispatches as a result of physical limitations.[3] DMM suggests that the ISO develop a registration process for any type of resource to qualify to use the proposed bid options.

In the Draft Final Proposal, the ISO proposes not to consider PDRs using the hourly block option in RUC.[4] This proposal is tied explicitly to a change proposed in the day-ahead market enhancements (DAME) initiative. In that initiative the ISO proposes to combine IFM and RUC, award day-ahead flexible ramp (DA FRP), and equate DA FRP to real-time flexible ramp (RT FRP). Resources with an hourly block schedule cannot be dispatched in the FMM or RTD,

[3] See *2017 Annual Report on Market Issues and Performance*, Department of Market Monitoring, June 2018, p. 107: http://www.caiso.com/Documents/2017AnnualReportonMarketIssuesandPerformance.pdf

[4] See *Energy Storage and Distributed Energy Resources Phase 3 Draft Final Proposal*, California ISO, July 11, 2018, p. 10: http://www.caiso.com/Documents/DraftFinalProposal-EnergyStorage-DistributedEnergyResourcesPhase3.pdf

rendering them ineligible to provide RT FRP, and consequently ineligible to provide DA FRP. The current DAME initiative proposal to eliminate RUC may be modified in that initiative. Therefore, the determination of whether or not PDRs using the hourly block option are eligible for receiving RUC awards should be made in the ESDER3 initiative independently from how RUC may be modified in the DAME initiative. If the DAME initiative ultimately proposes to eliminate RUC, the DAME initiative can consider the issue of whether or not hourly block PDRs should be counted as DA FRP.

DMM notes that allowing DR to use the hourly block bid functionality available for intertie transactions may require additional features in HASP to accommodate intertemporal constraints. For example, if a resource was committed in a preceding market run, HASP must account for the resource's existing schedule and honor any intertemporal constraints. Schedules from prior market runs could impact hourly block schedules in subsequent HASP runs.

The ISO should address the CCDEBE proposal's shortcomings related to DR before DR is permitted to bid non-zero commitment costs.

In the ESDER3 stakeholder process, the ISO has referenced the Commitment Costs and Default Energy Bids Enhancements (CCDEBE) initiative as introducing the ability for DR resources to submit non-zero commitment costs (minimum load and start-up costs). However, DMM believes CCDEBE's applicability to DR requires further clarity. We refer the ISO to DMM's comments on the *CCDEBE Revised Draft Final Proposal*[5] and previous ESDER3 comments on this issue.[6]

The ISO has communicated to stakeholders that the CCDEBE policy will enable DR to bid non-zero commitment costs to help manage commitment in RUC and infeasible real-time dispatches. The CCDEBE proposal was approved by the ISO Board in March but omitted key details regarding DR resources. Specifically, the ISO did not outline how proxy costs for DR resources would be calculated so that bid caps and reasonableness thresholds for commitment cost offers could be calculated. Without proxy costs for DR resources, DR commitment cost offers could be unbounded upon implementation of CCDEBE. DR resources could effectively prevent themselves from being committed by submitting excessively high commitment costs. The ability to bid unbounded commitment costs poses concerns about economic withholding and potential exercise of market power.

The CCDEBE proposal has been approved by the Board, but has yet to be filed at FERC. The ISO should address the CCDEBE proposal's shortcomings related to DR before DR is permitted to bid

[5] *DMM Comments on Commitment Cost and Default Energy Bid Enhancements Revised Draft Final Proposal*, DMM, February 28, 2018, p. 23

[6] *DMM Comments on ESDER3 Straw Proposal*, DMM, April 9, 2018, p. 3: http://www.caiso.com/Documents/Comments-DMM-EnergyStorage-DistributedEnergyResourcesPhase3WorkingGroup-Mar292018.pdf

non-zero commitment costs. The ISO should provide clarity on how commitment cost bids, reference levels, and mitigation will apply to DR.

III. Storage and DER participation model enhancements

Load Shift model (PDR-LSR)

DMM supports the concept of a behind-the-meter (BTM) participation model that allows resources to both supply and consume. While the ISO's proposed PDR-LSR model would provide BTM resources with these options, designing this model within the PDR construct (but using two resource IDs—a supply/curtailment ID and a load/consumption ID—for a single resource plus an additional set of participation constraints) could be limiting for future DER integration. Going forward, DMM encourages the ISO to consider entirely new participation models for DER as opposed to fitting new participation models within existing frameworks. New, more flexible models could better accommodate the participation of diverse DERs and aggregations going forward.

The proposed PDR-LSR design may be restricting because:

- A two resource ID model may be limiting for DER aggregations with potentially multiple metered assets.
- DMM outlined in prior comments that intertemporal constraints on the supply/curtailment ID could result in two separate dispatches between resource IDs.[7] The ISO has prescribed a set of PDR-LSR participation constraints to minimize the occurrence of conflicting dispatches including:
    - 0 MW Pmin required for the supply/curtailment resource ID
    - Resources must be able to ramp between Pmin and Pmax between 15 or 5 minute intervals depending on whether they are 15 or 5 minute dispatchable
    - Supply/curtailment resource ID must bid above the Net Benefits Test (NBT) price
    - Load/consumption ID must bid negative prices

These constraints may be limiting or preclude participation for certain resource aggregations. For example, these constraints would preclude resources that have slower ramp rates or non-zero Pmin. Additionally, under the ISO's PDR-LSR use case (load and a storage asset), a resource owner's cost to discharge storage may be different from its cost to curtail load. However, a scheduling coordinator could only reflect a single cost curve for its

[7] *DMM Comments on ESDER3 Revised Straw Proposal*, DMM, July 6, 2018, p. 2-4: http://www.caiso.com/Documents/DMMComments-EnergyStorage-DistributedEnergyResourcesPhase3-Jun252018.pdf

supply/curtailment resource ID. A more flexible model could allow a single resource's different configurations and costs to be explicitly reflected in the market.

A multi-stage generator (MSG) approach to modeling DER aggregations could be an improvement over the PDR-LSR approach because:

- Physical characteristics and costs of DER aggregations could be reflected in varying configurations
- A MSG model could better accommodate DER aggregations with more than two metered assets
- Modeling each resource configuration explicitly supports more accurate default energy bid (DEB) and proxy cost calculations
- A MSG model could better accommodate intertemporal constraints and prevent dual dispatches on separate resource IDs

DMM encourages the ISO to explore new participation models for diverse DERs and DER aggregations that depart from the existing PDR structure. While the feasibility of implementing more complex designs must be considered, participation models that explicitly reflect varying resource costs and configurations could support new resource integration and more efficient market participation.

The ISO should continue to work with stakeholders to identify enhancements to its existing storage participation models.

DMM encourages the ISO to continue working with stakeholders to identify limitations of its storage participation models and where costs or constraints faced by storage resources could be more efficiently reflected in these models. Based on stakeholder feedback, the ISO proposes to defer NGR modeling enhancements to a future stakeholder process.

Some stakeholders have mentioned in comments that NGR modeling enhancements could be deferred because NGR is not subject to market power mitigation today and energy bids provide room to recover commitment costs.[8] This reasoning should not be considered sustainable – should NGR resources be subject to mitigation in the future, non-marginal costs that stakeholders reflect in energy bids would not be included in default energy bids (DEBs) used in market power mitigation processes. Additionally, costs that scheduling coordinators reflect in NGR energy bids that are not marginal costs should be modeled explicitly, not conflated with marginal cost energy offers.

As storage and DERs become more prevalent on the system, the ISO should also consider how DEBs and proxy costs should be calculated for these types of resources currently exempt from

[8] *Comments of the California Energy Storage Alliance (CESA) on CAISO ESDER 3 Revised Straw Proposal*, May 21, 2018, p.4: http://www.caiso.com/Documents/CESAComments-EnergyStorage-DistributedEnergyResources-RevisedStrawProposal.pdf

mitigation. At minimum, DMM believes a storage operator should be able to update a storage resource's DEB hourly (the granularity of real-time offers) because a storage resource's opportunity costs change dynamically with its real-time dispatch. The ISO could use a forward price curve to estimate a storage assets' short run opportunity costs in order to calculate real-time DEBs.

DMM encourages the ISO to continue to evaluate the efficiency of its storage models and identify where these models should be enhanced. Enhancements to the ISO's storage participation models may even be necessary, given model parameters specified in FERC Order 841. The ISO could use Order 841 compliance as a means to facilitate further discussion on potential storage model enhancements.

The ISO should study the efficacy of its current and proposed baseline methodologies.

The current PDR baseline approach (10-in-10 historical average of non-event hours) creates an incentive for resources to increase load in high load hours on non-event days (hours where the DR resource is most likely to be called) in order to generate a more favorable baseline. The resource can maximize the baseline from which its load reduction is measured, maximizing its wholesale performance and compensation when scheduled by the ISO.

While this incentive misalignment exists today for DR under current baseline calculations, the issue becomes more pronounced when a 10-in-10 approach is used for the PDR-LSR model that considers both consumption and curtailment. Using historic like-hours or intervals for the baseline calculation allows resources with a storage device to easily shift charge/discharge between intervals to maintain favorable baselines without providing the system any incremental benefit. DMM described these incentive issues in prior ESDER3 comments.[9] DMM believes that the growth of increasingly configurable DER aggregations will result in 10-in-10 type baselines being more easily impacted by deliberate actions of the resource owner.

DMM encourages the ISO to study the efficacy of its current baseline methodologies for DR resources and monitor the performance of its proposed baseline methodology for PDR-LSR. Because 10-in-10 baselines create known incentive issues, DMM suggests that the ISO regularly assess the efficacy of its baseline approaches and consider alternative baseline approaches if necessary. Alternative baseline approaches could eliminate incentive issues and be adopted in the future for BTM resources with highly controllable and configurable assets.

[9] See *DMM comments on ESDER3 Revised Straw Proposal*, July 6, 2018, p. 5-7: http://www.caiso.com/Documents/DMMComments-EnergyStorage-DistributedEnergyResourcesPhase3-Jun252018.pdf