



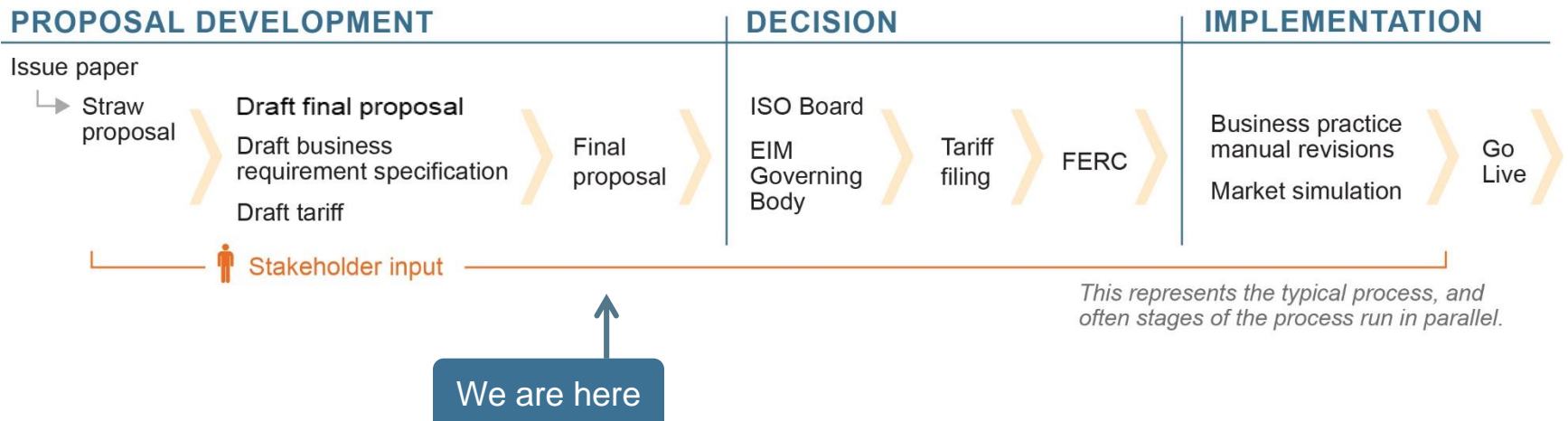
Energy Storage and Distributed Energy Resources Phase 4 – Final Proposal Update

Stakeholder Meeting
August 27, 2020

ESDER 4 Schedule Update – includes splitting out elements for further development

Date	Milestone
<i>August 20</i>	<i>Post Final Proposal</i>
August 27	Stakeholder Call
September 10	Comments (final positions) due
Sep 16	Present to EIM GB (advisory)
Sep 30/Oct 1	BOG approval
<i>September (TBD)</i>	<i>Revised Draft Final Proposal ESDER4 – DEB</i>
<i>November (TBD)</i>	<i>Final Proposal ESDER4 - DEB</i>
<i>December 16/17</i>	<i>BOG Approval for the DEB</i>
Fall 2021	Full ESDER 4 Implementation (proposed)

ISO Policy Initiative Stakeholder Process



ESDER 4 published its Final Proposal on August 20th for the four elements seeking ISO Board approval October 1

1. End of Hour State-of-charge parameter for the non-generator resource model
2. Vetting application of an ELCC valuation for variable-output demand response resources
3. Establishing parameters to better reflect demand response resource operational characteristics
4. Streamlining market participation agreements for non-generator resource participants

Proposal for applying market power mitigation to energy storage resources will continue to be stakeholdered – (ESDER-DEB)

- Publication of DEB revised final proposal, stakeholder call and comment opportunity
- ISO Board approval in December

1. End-of-hour state-of-charge parameter

- Proposing an optional real-time end-of-hour state-of-charge parameter to more flexibly manage storage, originally intended to support MUA and SATA resources
- The end-of-hour SOC bid parameter is submitted as a minimum and maximum MWh range
 - To be feasible, the end-of-hour SOC must respect ancillary service awards and physical minimum and maximum charge constraints (both stored in Masterfile or bid in)
- Impact of its use clarified due to RAE UCAP proposal
 - Clarified that EOH SOC use shouldn't impede a resource's ability to achieve its 4-hour RA obligation
 - Highlights impact of its use on the resource's UCAP value when RAE changes are implemented in 2023
- The CAISO reserves the right to monitor for abuse of EOH SOC parameter and may bar a resource from utilizing parameter in the future

EOH SOC parameter cont.

- Previous proposal simply excluded hours from RT bid cost recovery when EOH SOC was submitted; final proposal excludes contributions to RT BCR calculations during intervals when energy award revenue is less than bid cost in hour and hour prior to the EOH SOC parameter, no modifications made to AS award components of BCR settlements.
 - **If bid cost > revenue, then interval will be set to 0**
 - **If bid cost < revenue, then no change to interval**
- Excludes intervals with an uneconomic dispatch, but allows additional revenue surpluses to flow through to the daily RTM BCR calculation and could be use to cover BCR shortfall in other periods without an EOH SOC parameter or self-schedule submitted, to address potential gaming opportunities

EOH SOC parameter cont.

- Proposal extends modifications to BCR settlements to the hour prior to a self schedule.
- Through impact assessment the CAISO recognized the need to clarify modifications to the BCR eligibility for self-schedules under different scenarios:
 1. Restatement of DA Award as RT Self-schedule: eligible for RT Bid Cost Shortfall
 2. RT self-schedule increment or decrement of DA Award: ineligible for RT Bid Cost Shortfall
 3. RT self-schedule with economic bid with dispatch: eligible for RT Bid Cost Shortfall
 4. RT self-schedule with economic bid without dispatch: ineligible for RT Bid Cost Shortfall

EOH SOC parameter cont.

- Proposal recognizes different time horizons across the real-time markets and proposes alignment of market application
 - Aligns visibility of the EOH SOC bid constraint to the same binding intervals for both the 5-minute (RTD) and 15-minute real-time (RTPD) markets
 - An implied end of hour constraint will be applied at the end of the time horizon for 5-minute (RTD) runs
 - The end of horizon constraint will be set to the end of hour constraint, adjusted for the resource's full charging capability between the end of horizon and end of hour
 - Final Proposal incorporates feedback from MSC meeting
 - Clarifies that EOH SOC bid information will be released to STUC after bidding closes for the RT market in which the EOH SOC is binding (i.e. T-75 from EOH SOC), to prevent any potential gaming opportunities

2. Vetting application of an ELCC methodology in valuing Variable Output Demand Response

- The RA program must evolve to ensure the RA fleet can meet capacity and energy needs all times of the year
 - California will rely more heavily on both variable and availability-limited resources as we move to decarbonize the grid
 - It is critical to assess the ability of preferred resources to displace both the capacity and energy provided by traditional thermal generation
- E3 analyzed the ELCC value of DR to the CAISO system today (2019) and the future (2030)
 - Study found ELCC value for DR differs from current QC values for two reasons:
 - DR does not bid, in aggregate, at levels equal to its NQC value
 - The times when DR is bid are either not at optimal times or not for long enough to earn full ELCC value

Vetting application of an ELCC methodology in valuing Variable Output Demand Response (cont.)

- E3 provided potential methodology for allocating DR portfolio ELCC to different program types, using program characteristics such as duration and number of calls
- CAISO included proposal to accompany an ELCC methodology, which would allow DR to fulfill its offer obligations by bidding its full variable capability, rather than a fixed value, without being subject to RAIM

The Final Proposal makes no modifications to the variable output demand response proposal or study, but incorporates stakeholder feedback on study results

- Following the May 27, 2020 stakeholder call, Southern California Edison (SCE) identified a portion of their resources' bid volumes were limited by the discrete dispatch size limitation
- SCE refined bid volumes to reflect the full capability of the resources
 - The CAISO appreciates the work done by SCE related to this effort and believes these modified bid volumes should be considered in any future studies performed to establish ELCC values
 - Modifications to DR bids since the study should not inhibit consideration of the methodology used in the ESDER 4 study

Additional feedback received on the study results and application of an ELCC for demand response

- SCE and PG&E informed the CAISO that demand response resource bids do not include the 15% PRM and line loss adder that is included in the qualifying capacity value of demand response
- Discussions with the Market Surveillance Committee indicate support for development of an ELCC value for demand response

3. Establishing parameters to better reflect demand response resource operational characteristics

- Some demand response program designs have a limited number of activations and a set number of hours available for dispatch within a day.
- Proposal provides demand response resources a new daily max run time constraint
 - The maximum daily run time constraint allows a demand response resource to identify the maximum number of hours the resource could be “curtailed” over the course of a day
 - It’s an optional master file parameter, not a requirement
 - Minimum 1 MW curtailment size threshold given adding new constraints impact system performance; prevent possibility of optimizing hundreds of fractional megawatt resources

4. Streamlining market participation agreements for non-generator resource participation

- Currently, Non-generator resources must execute a participating load agreement (PLA) and a participating generator agreement (PGA) due to their ability to seamlessly operate as a load or generator
- Proposal allows non-generator resources to participate under a single participation agreement
 - NGRs that operate as a load and generator or choose to operate only as a generator will execute the PGA
 - NGRs operating as dispatchable demand response will execute the PLA
- NGRs operating under existing agreements will not be required to execute new agreements

Note – Plan to request earlier 2021 implementation with separate tariff filing

Applying market power mitigation to energy storage resources – ESDER4 Final Proposal

- The proposed DEB for storage includes small clarifications but continues to estimate marginal cost based on four inputs:
 - Energy, losses, cycling costs (VO&M), opportunity costs
 - DEB represents an upper bound of costs for storage
- Similar formulas will be applied to real-time and day-ahead mkts
- Formulation is a simplified version of earlier proposals
- This formulation is fixed for the day, and relatively imprecise
- DEB does not mitigate negative (MW) portions of a storage resource's bid curve
- Relatively good support from SC community
- DMM continues to have concern about accuracy of DEB

The ISO completed multiple meetings with the MSC discussing the default energy bid for storage

- ISO had two public meetings with the MSC on ESDER 4 topics, in May and July, where DEBs were discussed
- MSC is producing a formal opinion for the initiative, which will be posted in the next few weeks
 - In advance the MSC relayed additional substantive feedback to the ISO
- ISO may want to include some of this feedback into the proposal with small impacts to the overall policy direction:
 - May consider not applying DEBs to small storage resources owners
 - May consider removing opportunity from the day-ahead default energy bid, as the values may be redundant

Note – All changes will be formally proposed by the ISO, with an opportunity for stakeholder review and comment

Next steps

- All related information for the ESDER initiative is available here: <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Energy-storage-and-distributed-energy-resources>
 - Please submit stakeholder written comments on today's discussion and the hybrid resources draft final proposal by **September 10, 2020**
- Important – Please review new process for submitting comments**
- Provide comments using the new stakeholder commenting tool
 - First-time users must register using their email address in order to submit comments on initiatives
 - The commenting tool is located on the Stakeholder Initiatives landing page (click on the “commenting tool” icon): <https://stakeholdercenter.caiso.com/StakeholderInitiatives>