Energy Storage and Distributed Energy Resources Phase 3 (ESDER 3)

Revised Straw Proposal

Stakeholder Conference Call
May 10, 2018
9 a.m. – 12 p.m. (PDT)
<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 - 9:10</td>
<td>Stakeholder Process and Schedule</td>
<td>James Bishara</td>
</tr>
<tr>
<td>9:10 - 9:15</td>
<td>Introductions</td>
<td></td>
</tr>
<tr>
<td>9:15 - 9:30</td>
<td>Background and Scope</td>
<td></td>
</tr>
<tr>
<td>9:30 – 9:45</td>
<td>DR Modeling Limitations</td>
<td></td>
</tr>
<tr>
<td>9:45 – 10:00</td>
<td>Removal of single LSE requirement and DLA</td>
<td>Eric Kim</td>
</tr>
<tr>
<td>9:45 – 10:00</td>
<td>Removal of single LSE requirement and DLA</td>
<td>Jill Powers</td>
</tr>
<tr>
<td>10:00 – 10:40</td>
<td>PDR-Load Shift Resource</td>
<td></td>
</tr>
<tr>
<td>10:40 – 11:15</td>
<td>Measurement of EVSE Performance</td>
<td></td>
</tr>
<tr>
<td>11:15 – 11:30</td>
<td>Update on MUA</td>
<td></td>
</tr>
<tr>
<td>11:30-11:50</td>
<td>Update on NGR</td>
<td></td>
</tr>
<tr>
<td>11:50 - 12:00</td>
<td>Next Steps</td>
<td>James Bishara</td>
</tr>
</tbody>
</table>
STAKEHOLDER PROCESS
CAISO Policy Initiative Stakeholder Process

POLICY AND PLAN DEVELOPMENT

Issue Paper → Straw Proposal → Draft Final Proposal → Board

We are here

Stakeholder Input
Scope/Objectives
Scope for ESDER 3

- New bidding and real-time dispatch options for demand response (DR)
- Removal of the single load serving entity (LSE) aggregation requirement and the need for application of a default load adjustment (DLA)
- Load shift product for behind the meter (BTM) storage
- Measurement of behind the meter electric vehicle supply equipment (EVSE) load curtailment
- Assessment of multiple-use application (MUA) tariff and market design changes
- Develop a process to qualify NGRs for use-limited status
Objectives

• Review changes and updates to proposal
  – DR modeling limitations
  – Removal of single LSE requirement and DLA
  – Load Shift Product
  – Measurement of EVSE performance

• Updates on MUA and NGR
Commitment Costs and Day-Ahead Market Enhancements

- Commitment Cost and Default Energy Bid Enhancements (CCDEBE)
  - Allows resources with a 0 MW minimum operating level to reflect minimum load and start-up costs
  - Still in tariff development phase
  - Stakeholders are encouraged to track CCDEBE initiative

- Day-Ahead Market Enhancement (DAME)
  - Elimination of RUC
  - Development of imbalance reserve product
    - Resource will have a MOO in real-time market with IR award
New bidding and real-time dispatch options for DR

• Two new bidding options

(1) Hourly block – Energy schedule is committed for the hour and is communicated 52.5 minutes before the flow of energy
• Resource is a price taker for the full hour
• No bid cost recovery

(2) 15 minute dispatchable – Bids submitted, committed at FMM price, and communicated 22.5 minutes before flow of energy
• Eligible for bid cost recovery
REMOVAL OF SINGLE LSE REQUIREMENT AND DLA
Proposing to remove the single LSE aggregation requirement and application of the DLA

• The CAISO proposes to
  – Remove the requirement of a PDR or RDRR resource aggregation to be limited to one LSE
  – Develop a SIBR rule to only accept bids above the Net Benefits Test threshold price for these resources
    • Eliminates need for the default load adjustment settlement mechanism tied to the resource’s LSE
Pre-Market

- The DRRS requires a PDR/RDRR to register under a single LSE
- The CAISO will remove the single LSE requirement within the DRRS
- No other changes have been identified
Market - SIBR Bidding Requirement

• Ensures that PDR/RDRR resources are net beneficial to the system
• SIBR will use monthly NBT prices to validate bid submissions
  – SC will be able to resubmit bids until the market closes
• In the case an RDRR will need to submit a bid in the real-time market
  – SIBR will continue to validate submission of the bids based on the current rule requiring bid prices be at or above 95% of the energy bid price ceiling.
PROXY DEMAND RESOURCE-LOAD SHIFT RESOURCE
Load Shift will be an option provided for a demand response resource participating under a Demand Response Provider Agreement.

### Demand Response Provider Agreement

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proxy Demand Resource (PDR)</td>
<td>Economic demand response that only provides load curtailment</td>
</tr>
<tr>
<td>Reliability Demand Response Resource (RDRR)</td>
<td>Emergency response resource</td>
</tr>
<tr>
<td>PDR Load Shift Resource (PDR-LSR)</td>
<td>Economic demand response that provides both load curtailment and consumption</td>
</tr>
</tbody>
</table>
This load shift option will initially be only available for PDRs utilizing sub-metered behind the meter energy storage.

The PDR-Load Shift Resource (PDR-LSR) will allow for the provision of grid services for both the decrease or increase of load.

**Key features**

- Requires direct metering of BTM energy storage
- Resource pays full retail rate for all charging energy
- For load curtailment
  - Maintains RA capacity eligibility
  - Non-exporting rule applies
- For load consumption
  - Ineligible for RA capacity and ancillary services
  - Ability to bid a negative cost for energy services
Pre-market: Registration and Masterfile

• A PDR-LSR must create a registration for both curtailment and consumption; cannot register to only offer load consumption
  – Registrations for both resources may utilize the same service account(s)
  – Registrations must include locations with a sub-metered storage device.

• The PDR-LSR will be registered as two separate resource IDs in the Masterfile
  – Resource ID for load curtailment (PDR-$LSR_{curt}$)
  – Resource ID for load consumption (PDR-$LSR_{cons}$)
Bidding and Energy services

**Bidding**
- Both PDR-LSR bidding options must be uniform
  - 15-minute or 5-minute dispatchable
- Will be eligible for bid cost recovery
- PDR-$LSR_{curt}$ can bid at or above $0$
- PDR-$LSR_{cons}$ can bid from -$150$ to $< 0$

**Energy Services**
- Energy
- Flexible Ramping Product
- Imbalance Reserve Product (DAM enhancements initiative)
PDR-LSR Performance Evaluation Methodology

• Will measure and net out “typical use” to define incremental value of load shift provided

• The performance methodology was referenced as MGO-Shift and MEC in revised straw proposal but will now be renamed to:
  – LSR-curtailment
    • \( LSR_{\text{curt}} = [|G(t)| - G_{LM}] \)
  
  – LSR-consumption
    • \( LSR_{\text{cons}} = [G(t) - G_{LM}] \)
PDR-LSR “typical use” calculations

• Typical Use Curtailment ($G_{LM\text{curt}}$): 10-in-10 CLB, using 10 non-event hours including both consumption and curtailment but only accept a value that is at or above 0.

$$G_{LM} = \text{Max} \{(G_{LM\text{curt}} + G_{LM\text{cons}}), 0\}$$

• Typical Use Consumption ($G_{LM\text{cons}}$): 10-in-10 CLB, using 10 non-event hours including both consumption and curtailment but only accept a value that is at or below 0.

$$G_{LM} = \text{Min} \{(G_{LM\text{curt}} + G_{LM\text{cons}}), 0\}$$
Please refer to attachment “PDR-Load Shift Resource Example”

Key takeaways from performance evaluation methodology of PDR-LSR

• Both methodologies will incorporate consumption/curtailment values when calculating “typical use”

• The net-export rule will only apply under the LSR-curtailment methodology

• When choosing non-event hours for both curtailment and consumption, events from either resource will be taken out.
  – An event from either resource creates “non-typical” behavior of those resources.
RECOGNITION OF BTM EVSE LOAD CURTAILMENT
Proposing to enable EVSE sub-metering and extend MGO performance method for EVSEs

- The proposal will allow for an EVSE’s performance to be measured differently from the host facility
Registration and Metering Standards

• EVSEs will be able to calculate two types of customer load baselines
  1. EVSE residential – Will use a 5-in-10 customer load baseline
  2. EVSE non-residential – Will use a 10-in-10 customer load baseline
• All meters will follow the CAISO’s Metering BPM – Appendix G and Settlement Quality Meter Data Plan requirements
  – Appendix G applies if relevant LRA has not set any standards

https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering
Performance evaluation methodology

• EVSE performance will be measured using either the 5 in 10 or the 10 in 10 customer load baseline methodology
  – Both methodologies will have a look back period of 45 days using either 5 or 10 of the most recent non-event hours
  – Meter data derived from CLB will be 5-min granularity
    • If an EVSE generates 15-minute interval data, the SC will transpose the data to three 5-minute intervals.
• Load point adjust will not apply to the EVSE baselines
UPDATE ON MULTIPLE-USE APPLICATIONS
The CPUC has held multiple working group meetings

- The CAISO has been actively engaged in the working group meetings
- Assisting in the draft of a report to the commission due by August
- At the moment, outside of identifying transmission level services for the pending report, the CAISO has not identified MUA issues that will require separate treatment in an initiative
UPDATE ON NON-GENERATOR RESOURCE
The CAISO has not made any changes to the NGR proposal

• CAISO has yet to hear from stakeholders on use-limited qualifications

• Revised Straw Proposal removed the consideration of identifying commitment costs for NGRs
  – NGR is modeled as a resource that is available and ready to be dispatched
  – This clarification will require an alignment between the tariff and BPM
NEXT STEPS
## Next Steps

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised Straw Proposal Posted</td>
<td>April 30, 2018</td>
</tr>
<tr>
<td>Stakeholder call</td>
<td>May 10, 2018</td>
</tr>
<tr>
<td>Stakeholder comments due</td>
<td>May 21, 2018</td>
</tr>
</tbody>
</table>

Written stakeholder comments on the issue paper are due by COB May 21 to [InitiativeComments@caiso.com](mailto:InitiativeComments@caiso.com).