Energy Storage and Distributed Energy Resources Phase 4 – ESDER 4

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The ESDER 4 Initiative contains three enhancements that fall under the EIM Governing Body's advisory role.

1. Optional end-of-hour state-of-charge parameter for storage resources

2. Parameters to better reflect demand response resource operational characteristics

3. Streamline market participation agreements for non-generator resource participants

The ESDER 4 initiative provides enhancements for efficiently dispatching storage resources.

- Storage is the predominate resource type in the ISO's interconnection queue
  - 1500 MW of interconnected storage capacity by the end of 2021
  - Lithium-ion batteries with 4-hour duration and hybrid resources
- The ISO markets have largely been designed around gas and renewable resources
  - enhancements are needed to integrate and accommodate the unique attributes of storage
- Enhancements are needed to meet the growing influence of storage resources on the market and grid reliability

1. End-of-hour state-of-charge parameter provides real-time management of future use commitments of storage resources.

- Currently state-of-charge is managed through self-scheduling
  - freezes out flexibility between bid submission and market execution
  - does not allow setting a minimum or maximum state of charge range
- End-of-hour state of charge bid parameter is submitted as a minimum and maximum MWh range
  - must respect ancillary service awards and physical minimum and maximum charge constraints
- Both self-scheduling and the end-of-hour state-of-charge parameter impact the bid cost recovery settlement
  - requires market revenues to be evaluated against bid cost recovery settlement in each interval to avoid gaming concerns

2. New parameter to better reflect demand response resource run-time limitations.

- 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
  - Maximum daily run time constraint allows a demand response resource to identify the maximum number of hours per day the resource could be “curtailed”
  - Optional master file parameter, not a requirement
  - Minimum 1 MW curtailment size threshold to mitigate system performance impact

3. Streamline market participation agreements for non-generator resource participation.

- Currently, non-generator resources must execute both a participating load agreement and a participating generator agreement
- Propose allowing non-generator resources to participate under a single participation agreement
  - Non-generator resources that operate as a storage device or choose to operate only as a generator will execute the participating generator agreement
  - Non-generator resources operating as dispatchable demand response will execute the participating load agreement
- Non-generator resources operating under existing agreements not required to execute new agreements

Stakeholders are overall supportive although some prefer more a sophisticated approach.

- Energy storage proposal comments
  - Stakeholders supportive of the end-of-hour state-of-charge parameter with the bid cost recovery refinement to address gaming issue
  - DMM expressed that the bid cost recovery tool could be more sophisticated and less restrictive under certain conditions
- Demand response proposal comments
  - Stakeholders strongly supported the ability to use a maximum daily run time parameter to manage program constraints

The ESDER Phase 4 proposals provide important enhancements to more efficiently manage energy storage and demand response resources.

- Provides an optional end-of-hour state of charge parameter to flexibly manage resource's real-time state of charge
- Respects a demand response resources maximum daily run time constraints
- Reduces contract administration burden when bringing new non-generator resources into the market