



California ISO

Demand and Distributed Energy Market
Integration Working Group
Discussion Paper

June 13, 2025

Table of Contents

Executive Summary	1
Introduction	2
Background	2
DDEMI Working Group Process	2
DDEMI Working Group Deliverables	3
DDEMI Working Group Stakeholder Recommendations	3
Discussion Paper Summary	3
DDEMI Working Group Topics	3
DDEMI Working Group Principles	4
DDEMI Working Group Problem Statements	5
Proposed Problem Statements and Discussion Topics	5
1. Performance Evaluation Methodologies	5
2. Economic-based Demand Response Participation Model	6
3. Reliability-based Demand Response Participation Model	7
4. Distributed Energy Resource Participation	7
5. Expanding demand side bidding options	7
6. Enhancing demand flexibility market options	7
Action Items identified for the Working Group	8
Appendix	9

Executive Summary

This first revised Discussion Paper provides stakeholders with an overview of the discussions to date in the ISO-hosted and stakeholder-driven Demand and Distributed Energy Market Integration DDEMI Working Group meetings.

Specifically, the paper provides background on the working group model and the working group progress made to create a history of conversations to date as well as provide an opportunity to reflect, comment, and prepare for subsequent discussions. This paper is a tool to assist the DDEMI Working Group participants in organizing discussions and a means of accelerating collaboration between stakeholders.

The DDEMI Working Group process intends to deliver on the commitment the ISO made to continue working collaboratively with stakeholders to explore enhancements or development of participation models and market rules facilitating the representation of demand and distributed energy, independently or managed in aggregation, in the day ahead and real time California ISO Markets.

The ISO anticipates the DDEMI Working Group will give stakeholders a more active role in informing the policy vision for market participation of Demand and Distributed Energy Resources. The output of the scoping phase of this effort will be “Stakeholder Recommendations”, consisting of scope items vetted through Working Group discussions for future Policy Development to support greater utilization and market integration of these resources and to meet the needs of stakeholders.

Lastly, this document outlines proposed topics to date for the working group, based on comments through the Working Group initiative page, the first working group meeting, and submissions into the 2024 Annual Policy Initiatives and Roadmap process. The initial discussion coalesced around six thematic areas from which the Working Group can explore the formalization of problem statements. 1.) Performance evaluation methodologies, 2.) Proxy Demand Response economic participation model enhancements, 3.) Reliability Demand Response Resource participation model, 4.) Distributed Energy Resource participation, 5.) Expanding Demand Side Bidding Options, and 6.) Enhancing demand flexibility market optimization options

Introduction

Background

The ISO has developed various load participation models to fit different resource characteristics capable of reducing their electric demand (load) to participate in the ISO day-ahead, real-time, and ancillary services markets. Demand-side resources can offer bids that reflect their flexibility to adjust their load in response to market schedules and dispatches. The ISO has implemented ways to facilitate wholesale market participation of such resources, and remains committed to empower the reliable, efficient, and seamless utilization of demand flexibility into ISO operations and markets.

ISO market rules also allow aggregations of distributed energy resources to participate in the ISO market and provide energy and ancillary services. The ISO has worked with stakeholders to lower barriers and enhance the ability for such resources to participate in the wholesale markets and remains committed to addressing challenges with pathways for advancing demand flexibility.

Stakeholder feedback on challenges in this area, the growth and adoption of new technology, and practical experience gained by the ISO since the last demand and distributed energy policy changes highlight the need to consider further enhancements or new participation models for demand, demand response, and distributed energy resources. In response, the ISO has extended the Demand and Distributed Energy Market Integration (DDEMI) working group as the forum for stakeholders to assess existing market mechanisms and bring forth new and persistent challenges for community consideration. We look forward to this engagement to hear how stakeholders believe this demand flexibility could be harnessed through market participation or representation in ISO markets.

DDEMI Working Group Process

The working group model reflects general stakeholder feedback and incorporates this input to inform policy development efforts, which leads to more alignment on the scope of an initiative, proposed solution discussions, and eventual policy design.

Stakeholders should take the opportunity to provide input on key components leading up to the policy development phase of the working group:

1. Define high-level principles for participation model design for demand and distributed energy resources
2. Form problem statements reflecting stakeholder concerns

3. Align on priorities and establish a proper meeting cadence to balance bandwidth
4. Illustrate challenge areas by exploring current ISO market operations, functionality, and processes
5. Determine action items for each challenge area to develop policy enhancements.

The ISO is open to hosting additional stakeholder workshops or providing additional background and education on key elements of the subject.

DDEMI Working Group Deliverables

Evolving This Discussion Paper

This DDEMI discussion paper will serve as a resource for stakeholders by reflecting the discussion that occurs during the working group process. The ISO will publish updated discussion papers throughout the Working Group process, and stakeholders will have an opportunity to submit written comments on each updated discussion paper.

The ISO encourages stakeholders to clarify their feedback in the working groups if the ISO does not accurately or comprehensively reflect their comments. The ISO also welcomes feedback on the layout of this document.

DDEMI Working Group Stakeholder Recommendations

This section of the discussion paper will reflect stakeholder recommendations for policy development. The ISO will memorialize problem statements that have been vetted through the working group and are recommended for policy development.

Discussion Paper Summary

DDEMI Working Group Topics

The topics outlined in this discussion paper synthesize stakeholder feedback from the DDEMI meetings and stakeholder comments. This categorization is intended to help organize the working group conversations, determine feasible schedules, and build on the diverse perspectives shared.

1. Expansion of current performance evaluation methodologies, including recognition of registration and metering alternatives

2. New or expanded economic-based demand response participation models (e.g., proxy demand resources)
3. New or expanded reliability-based demand response participation options (e.g., reliability demand response resources)
4. Distributed energy resource direct participation or indirect market optimization options
5. Expanding demand-side bidding options
6. Demand flex-direct market participation or indirect market optimization options

New categories may emerge as the working group progresses.

DDEMI Working Group Principles

Through iterative conversations within the first two Working Group sessions, stakeholders discussed and formalized the guiding principles with which the working group will consider how problem statements relate to market design principles to facilitate assessment of prioritization and potential trade-offs between approaches.

1. Efficiency
 - Market optimization produced least cost results while maintaining reliability.
2. Competition
 - Market rules expand competition to the benefit of consumers and allow flexible demand and smaller-scale resources to participate like conventional, large-scale generators.
3. Feasibility
 - Operationally feasible; the market can solve within prescribed timelines
 - Feasible implementation.
4. Simplicity
 - Market design elements are not overly complicated
5. Reliability/Compliance
 - Reliability and compliance standards are reflected in market design
6. Facilitate states' public policies, to the extent practicable

DDEMI Working Group Problem Statements

Problem statements should identify how current ISO processes or models need to improve to address the challenge area. Problem statements should offer a clear path to analysis and proposal development that satisfy the working group principles. As each thematic area is explored in the working group, the ISO and stakeholders will refine the problem statements.

Proposed Problem Statements and Discussion Topics

As part of ISO's role facilitating these discussions, the ISO synthesized submissions into the 2024 Policy Initiative Catalog and Roadmap process, stakeholder discussion on the February 5th DDEMI meeting, and subsequent comments into major themes. The Working Group will work to identify and refine concepts related to these themes into full problem statements.

1. UPDATED: Performance Evaluation Methodology

This topic reflects stakeholders' interest in exploring new or enhanced Performance Evaluation Methodologies (PEM).

The working group devoted the first three sessions reviewing informational material on the PEM topic, reviewing stakeholder presentations of potential challenges/issues, and refining problem statements to be considered for future policy development efforts.

During Working Group Session 1, stakeholders presented on the potential need for additional PEMs, changes to PEM settlement methodologies, and prescriptive baselines.

During Working Group Session 2, stakeholders presented on device-level measurement. In addition, the ISO presented further level setting information on current design to clarify key elements on telemetry, metering, and PEM foundations in order to start formulating problem statements from the opportunity/challenge areas.

During Working Group Session 3, stakeholders presented on the establishment of a formal Demand Response agreement for WEIM entities in order to facilitate manual adjustments to DR forecasts and logical telemetry. The Department of Market Monitoring also presented on the heavy utilization on a select few of current PEM selections within the Day Matching Combined methodology. The working group came together to review the proposed problem statements, feedback from Working Group participants via written comments, and discussions, to finalize problem statements within the PEM theme.

The Working Group has suggested the following problem statements to move forward for further vetting in a subsequent phase.

1. Full suite of currently offered methodologies is underutilized, with heavy centralization in a single baseline methodology type (Day Matching Combined = 99%), which raises concerns on efficiency and accuracy in performance evaluation.
2. Existing PEMs, such as the commonly used 5-in-10 and 10-in-10 approaches, are not well suited for emerging DR participation (inclusive of all technology types such as Behind-the-meter batteries, aggregations, Electric Vehicle charging, etc.) whose frequent dispatching distorts baseline calculations.
3. BTM device-level measurement is not recognized for use in developing baselines for PEM options. Performance evaluations depend on energy measurement (load and generation) and don't recognize non-energy metered technologies contributions to load reduction calculation equivalents.
4. CAISO's limited flexibility in adjusting details beyond its core baseline methodologies framework without tariff changes, restricts ability to keep pace with evolving market needs.
5. Requirement for control group end users to be registered in the Demand Response System limits use of non-participating end users within a control group and is in conflict with consumer data privacy rules.

Also, in Session 3, the Working Group discussed a proposed problem statement for registration of locations to be at the service account level, posing a challenge for the development of resources at the customer device level, wherein varied positions and feedback were heard. As this potential problem statement warrants further discussion with the community, it will be revisited at a later time.

2. Economic-based Demand Response Participation Model

Stakeholders highlighted the desire to explore new or expanded economic-based demand response models, such as the proxy demand resource (PDR).

Stakeholders suggested the following scope items be part of discussion for problem statement formation:

1. Conduct a holistic refresh of PDR programs and update baseline methodologies to integrate demand response programs.

2. Create a new variant of PDR called mPDR to more accurately reflect load reductions of PDR participants with behind-the-meter storage or Rule 21 exports.

3. Reliability-based Demand Response Participation

Stakeholders expressed the need to further examine CAISO tariff defined market rules applying to Reliability Demand Response Resources.

Stakeholders suggested the following scope items be part of discussion for problem statement formation:

1. Eliminate 100 MW cap, or change the exception criteria, for discrete RDRRs above 100 MW to participate in the CAISO markets.
2. Allow for any RDRR bid option to utilize startup-time listed in real-time dispatch.
3. Explore methods to consider fixed costs in economic dispatch decisions for RDRRs.
4. Allow RDRRs to reflect minimum on-times greater than one hour, to more accurately reflect RDRR run times.

4. Distributed Energy Resource Participation

Stakeholders expressed interest in examining current distributed energy resource direct participation or indirect market optimization options.

Stakeholders suggested the following scope items be part of discussion for problem statement formation:

1. Extend and harmonize demand response and distributed energy resource programs within WEIM and EDAM.
2. Explore behind-the-meter storage participation in wholesale markets.

5. EDITED Expanding demand side bidding options

Stakeholders expressed a desire to explore demand side bidding options within the ISO markets.

6. EDITED Enhancing demand flexibility market options

Stakeholders expressed a desire to explore participation models for load within the ISO day-ahead, real-time, and ancillary services markets.

Stakeholders suggested the following scope items be part of discussion for problem statement formation:

1. Develop market rules for use of hydrogen electrolyzer technology, and enable hydrogen electrolyzer technology to participate in CAISO markets as participating load resources.
2. Explore utilization of non-generator resource (NGR) participation model by WEIM entities.
3. Explore the representation of demand response through base schedules for WEIM entities.
4. Explore models to allow participating load resources to bid demand into the real-time markets.
 - a. ****As participating load is supply-side demand response, this item has moved to this theme****

Action Items identified for the Working Group

The below items were identified as follow-up items from the previous working group session(s):

1. Stakeholders to review reference materials related to current demand and distributed energy market participation rules (*see Appendix for links*)
2. ISO subject matter experts to provide additional reference material (Demand Participation Q&A document and reference deck on demand participation models for WEIM entities)

Appendix

1. Current demand and distributed energy market participation reference material
 - a. [Demand Response Market Participation comparison](#)
 - b. [CAISO.com computer based training on Demand Response](#)