Submit comment on Discussion paper and Mar 03 discussion

Initiative: Demand and Distributed Energy Market Integration

1. Please provide your organization's feedback on the approach to the Working Group's goals, process, evolution of the Discussion paper, and Stakeholder Recommendations (pg. 2-5) in the DDEMI Discussion Paper. Any suggestions to improve the Working Group process or deliverables? *

The California Efficiency + Demand Management Council (Council) and Leapfrog Power, Inc. (Leap) appreciate this opportunity to comment on the March 3 Demand and Distributed Energy Market Integration (DDEMI) Working Group (Working Group).

DDEMI Working Group Process

The Discussion Paper provides the following 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; and
5. Determine action items for each challenge area to develop policy enhancements.

These elements in this sequence appear to be a good approach toward developing concrete stakeholder initiatives that will improve opportunities for demand response (DR) and distributed energy resource (DER) participation in the CAISO market, so no changes to these five are necessary. However, one corollary for consideration is that, when possible, the Working Group identify and exploit opportunities where multiple problem statements can be addressed through the same initiative. This may be an implicit within the Working Group process but to the extent it is not, it should be included in some way.

In addition, the Council and Leap would recommend that DDEMI's policy development phase allow certain proposals or changes to be "fast-tracked" based on stakeholder prioritization and ease of implementation. If stakeholders determine that a particular policy proposal has consensus support and minimal additional refinement is needed to implement, CAISO should move to implement these proposals at the end of the scoping phase – or even in the middle of the scoping phase, if proposals are scoped incrementally.

The proposal to move baseline methodologies from CAISO's tariff to its Business Practice Manual (BPM) is one such proposal that could be expedited this way, since it is simply a re-organizing of CAISO's documentation that does not require any actual policy changes. It would also be prudent to sequence this before other adjustments being considered to CAISO's Performance Evaluation

Methodologies (PEMs), so that any subsequent changes to these PEMs do not all require a FERC-approved tariff change to implement.

DDEMI Working Group Deliverables

The CAISO proposes that the Discussion Paper serve as a stakeholder resource by documenting Working Group discussions and vetted problem statements that are recommended for policy development. The Council and Leap support the inclusion of these two elements in order to document the basis for future stakeholder initiatives. The scope of the Working Group will include some complex issues, so it will be useful for stakeholders to be able to have this information for future reference. Also, the Appendix should continue to be used as a central location for links to additional important reference documents as they are discussed during the Working Group sessions.

DDEMI Working Group Topics

Based on early discussions and stakeholder proposals, the Discussion Paper lists the following initial categories for discussion:

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

The Council and Leap recommend no major changes at this point, as these appear to accurately capture the topics discussed so far. However, the Council and Leap would like to point out that categories #5 and #6 are somewhat duplicative, as both are described as addressing stakeholders desire to explore participation models for load with the CAISO markets. It may be possible to consolidate these two categories by moving the single discussion item listed under category #5 into category #6.

DDEMI Working Group Principles

The Discussion Paper lists the following market design principles:

1. Efficiency
    a. Market optimization produced least cost results while maintaining reliability.
2. Competition
    a. 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
    a. Operationally feasible; the market can solve within prescribed timelines
    b. Feasible implementation.
4. Simplicity
    a. Market design elements are not overly complicated
5. Reliability/Compliance
    a. Reliability and compliance standards are reflected in market design
6. Facilitate states' public policies, to the extent practicable

As the Council stated in the February 21 Joint DR Parties comments, these principles are all appropriate and should be retained. In addition, as recommended in the February 21 comments, the "Utilization" principle should be added and be defined as "cost-effective DR capacity is visible and accessible to CAISO, maximizing its use as a grid resource." This principle is intended to help ensure that the CAISO is appropriately considering the capacity benefits that DR can provide when making its decisions on which proposals to advance.

2. Please provide your organization's feedback on the overarching themes/areas and the associated scope items for problem statement formulation. Are there any additional themes/areas or individual scope items which should be explored further? *

DDEMI Working Group Problem Statements

The Discussion Paper recommends that "problem statements…identify how current CAISO processes 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." These parameters are appropriate and do not need to be changed. Similarly, the Council and Leap believe that the existing themes/areas and individual scope items are broadly comprehensive, so no additional items need to be added at this time.

3. Please provide your feedback on any specific topics that require further information/reference in order to facilitate substantive stakeholder conversation.

Proposed Problem Statements and Discussion Topics

The Discussion Paper provides six initial draft problem statements and discussion topics:

1. Performance Evaluation Methodology
2. Economic-based Demand Response Participation Model
3. Reliability-based Demand Response Participation
4. Distributed Energy Resource Participation
5. Expanding demand side bidding options
6. Enhancing demand flexibility market options

These generally capture the topics, but it is not clear that the Performance Evaluation Methodology (PEM) as currently written contemplates a PEM for thermal energy storage. This is a very specific technology not currently served in the CAISO market, so it is not clear whether it would be covered under "alternative baseline methodologies" (the third item under the PEM topic). To provide the necessary certainty, the Council and Leap recommend the following modification (added language underlined):

> 3. Explore the utilization of device level measurement**, ~~and~~** creation of alternative baseline methodologies**, and development of a PEM modeled on the Meter Generator Output PEM for thermal energy storage**.

In addition, the Economic-based Demand Response Participation Model should be modified to leave open the possibility that the intended outcome of a Modified Proxy Demand Resource (mPDR) – to recognize behind-the-meter (BTM) energy storage exports – might also be achievable by simply modifying the existing PDR product. The Council and Leap recommend the following modification to acknowledge that mPDR can be implemented as an expansion of PDR rather than as a new DR model entirely:

2. Create a new variant of PDR called mPDR**, or expand the existing PDR product to include a participation option that incorporates the features of the mPDR proposal,** to more accurately reflect load reductions of PDR participants with behind-the-meter storage or Rule 21 exports.

For Distributed Energy Resource Participation, aspects of the second scoping item might be redundant with the mPDR reference under the Economic-based Demand Response Participation Model because the ultimate purpose of the mPDR is to facilitate BTM energy storage participation in the CAISO market. Also, the second item under this topic lacks specificity. To address both issues, the Council and Leap recommend the following modification:

2. **Explore other issues connected to** behind-the-meter storage participation in wholesale markets **to the extent they are not addressed elsewhere**.

4. What feedback do you have on the challenges shared by Stakeholder presentations regarding service level load measurement & validation needed for control groups? Do the M&V and Performance Evaluation Methodology (PEM) options available today address the needs of diverse technologies? Are there additional technical challenges (e.g., technology-specific curtailment, control group validation, energy storage baselines) that should be considered in the working group?

This question appears to have left out a request for feedback on the presentation provided by Nostromo of its proposal for a Thermal Metered Generation Output (TMGO) PEM for thermal energy storage (TES). As Nostromo demonstrated, such a PEM would result in a more accurate measurement of TES performance compared to simply using a Day Matching baseline at the customer meter level because the Conversion Factor (of avoided BTUs from the TES to avoided electricity) varies from one day to the next. Nostromo's proposal appears to be geared toward "cold" TES and as such, its proposal involves the use of sub-meters to measure the reduced electrical consumption of a customer's chillers when the cold TES is activated. However, consideration should be given for expanding the TMGO PEM proposal to include "hot" TES. In contrast to the Nostromo cold TES product, hot TES could be used to reduce space or water heating load. To address this, the TMGO PEM proposal could be made more generic by requiring electric sub-meters for **either** the facility chiller or the facility space and/or water heater. The CAISO should designate this proposal for further consideration.

PG&E's *Proposal to Revise Demand Response Control Group Settlement Methodology* highlighted the problem created by the Control Group PEM requiring all customers comprising a control group to be registered in the CAISO's Demand Response Registration System (DRRS) which is problematic due to the legal and operational issues described by PG&E. To address this problem, PG&E's Proposal 1 is to remove DRRS registration requirements for customers comprising "Matched" control groups. Proposal 2 would address the pre-existing differences between Control and Treatment group load profiles. Although supportive of PG&E's efforts to expand the use of control group baselines in CAISO, the Council and Leap would like to emphasize that third-party DR providers do not have the capability to use "Matched" control groups (and therefore are limited to "Hold-out" control groups) because they are not able to access the load profiles of customers not enrolled with them. This points to the need for control group load profiles that are accessible to all DR providers, not only the IOUs.

This final point provides a good segue to the Leap proposal, *Prescriptive Baselines in CAISO* which addresses the operational barriers of using the current Control Group PEM for frequent dispatches. In contrast to the Control Group PEM which measures DER performance against a smaller group of non-participants and requires DR providers to have access to non-participant data, or withhold some of their customers from being dispatched, Leap proposes a Prescriptive Baseline that measures DER performance against the average historical load of similar customers. Using this approach, control groups that are accessible by all types of DR providers can be created in advance. This proposal is a creative approach to addressing the existing problems associated with existing performance measurement of frequently-dispatched resources and the absence of third-party DR provider access to "Matched" Control Groups. Leap's proposal could be paired with PG&E's Proposal 1 to eliminate the DRRS registration requirement and may render moot PG&E's Proposal 2. The CAISO should designate this proposal for further consideration.

5. What topic(s) would your organization be interested in presenting (what is the problem/issue seeking to be addressed)? Which stakeholders would it impact?

The Council and Leap are happy to present on the Modified Proxy Demand Resource and Device-Level Measurement proposals. Below is a problem description for each of these proposals as well as impacted stakeholders. In addition, the Council and Leap submit as an attachment a recent white paper that Leap published on regulatory measures that would increase DR participation in CAISO's wholesale market. This white paper provides additional detail on the two proposals listed below, and it also situates them within a broader set of regulatory reforms that would support market integration of DERs in California.

1. **Modified Proxy Demand Resource:**

   Stakeholders Impacted: Any entity that operates export-capable Proxy Demand Resources in the CAISO market.

   Problem Description: Currently, performance calculations for PDR participants with behind-the-meter (BTM) energy storage exclude measured exports of energy past the customers' meter, even if those participants hold Rule 21 export permits. This can significantly reduce the amount of BTM battery capacity that is available for CAISO to dispatch. Past studies have shown that residential battery capacity is often more than twice the average household load. However, without a mechanism in place to enable and credit batteries for exporting this power back to the grid, DR providers will not bid this additional capacity into the wholesale market.

   The mPDR proposal addresses this issue by allowing a DR resource's performance to be assessed at the resource level (rather than the meter level) as long as aggregate net load of storage and non-storage customers at the sub-LAP level is greater than zero. This would mean that performance in DR events will be measured at the sub-LAP rather than the individual customer meter. If a Rule 21-compliant battery exports power to the grid, it will lower the effective load at that sub-LAP, showing an overall improved performance in that DR event and allowing the aggregator managing that battery to nominate that battery's full capacity for that event. Net exports across the sub-LAP "virtual meter" (i.e. a situation where the sub-LAP load is negative) will not be counted, so from an operating perspective this would only ever look like a load reduction at the relevant sub-LAP.

2. **Device-level Measurement:**

Stakeholders Impacted: Any non-IOU entity that operates DR resources in the CAISO market.

Problem Description: Currently, very few IOU customers are enrolled in a DR program, so the vast majority of existing smart devices are not currently measured or controlled for the purpose of demand flexibility. One major obstacle to participating in a market-integrated DR program is the requirement that electricity customers authorize their meter data to be shared via their IOU's Click-Through Process (CTP), a cumbersome process with a relatively high drop-off rate. In Leap's experience, less than half of potential DR participants that begin this enrollment process are able to successfully enroll in their selected DR program.

The CAISO has established baseline options such as the Electric Vehicle Service Equipment (EVSE) and Metering Generator Output (MGO) PEMs that allow electric vehicles and BTM batteries to use device-specific load data to measure DR performance directly. However, customers using these options are still required to go through the CTP to be registered in CAISO's DRRS, removing one of the primary benefits of using device-level data to evaluate DR performance.

The California Energy Commission has recently tested the use of direct device enrollment in its Demand Side Grid Support (DSGS) program, and it found that allowing BTM storage customers to enroll outside the CTP significantly increased participation. Rather than authorizing data sharing via the CTP, participants in the DSGS program consent to sharing their data via their contract with their device provider. In the first year that this enrollment option was offered, the amount of participating battery capacity exceeded the battery capacity that third-party DR providers had enrolled in Resource Adequacy.

In addition, directly-measured devices in CAISO are currently required to meet overly strict accuracy standards that excludes most residential technologies. CAISO's Metering BPM establishes a 0.2 percent accuracy requirement for DER Devices, which is applied if local regulatory standards do not exist. However, this standard is not aligned with more recent accuracy requirements established by the CPUC for EVSE. Where possible, metering accuracy standards should be recalibrated so as to not unduly obstruct DERs from making use of these device-level measurement options, referencing experience in programs like the DSGS program that have adopted different standards while maintaining accurate measurements of device performance.

Furthermore, if CAISO were to enable greater use of device-level data for a wider range of technologies, including TES, heat pump water heaters, and smart thermostats, it would allow for more flexible participation by DR providers in CAISO's market. If the utility meter is used to measure DR performance, then all devices behind that meter need to be managed by the same entity. By contrast, if the use of device-level data was expanded, then each device could conceivably be bid into the CAISO market by a separate entity. With California homes increasingly hosting multiple DERs managed by different companies, this type of flexibility will be key to supporting large-scale participation of these resources in Resource Adequacy.

Overall, removing the above-mentioned barriers to the use of device-level data would provide a range of important benefits:

a. Dramatically increased participation of DERs in the CAISO market;
b. Faster and more accurate measurement of load curtailment;
c. Improved situational awareness for CAISO operators with visibility into the quantity and types of devices responding to market signals;

d. Dual participation in conflicting programs can be identified at the device level;
e. Greater customer choice of DR provider for devices, aggregators, or IOUs.