

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking To Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements.

Rulemaking 13-09-011  
(Filed September 19, 2013)

**RESPONSE OF THE CALIFORNIA INDEPENDENT SYSTEM  
OPERATOR CORPORATION TO QUESTIONS ON NEW MODELS OF DEMAND  
RESPONSE**

In response to the Administrative Law Judge's Ruling Requesting Responses to Questions Regarding the Pathway to New Models of Demand Response, Implementation of the Competitive Neutrality Cost Causation Principle, and Remaining Barriers to the Integration of Demand Response (Ruling), the California Independent System Operator Corporation (CAISO) files this response. This response reproduces the questions posed in the Ruling together with the relevant CAISO answers.

**I. Questions Regarding the Remaining Barriers to Integrating Demand Response into the CAISO Market**

*Q1: During the course of the workshop, parties identified seven remaining barriers to integrating current models of demand response into the CAISO market as listed in Section 2 above. Provide an approach for addressing them, e.g., working group, another proceeding, CAISO stakeholder process, etc. If there are other barriers that should be included, please describe them and suggest a potential approach for addressing them.*

During the April 4, 2017 workshop, parties identified and prioritized seven barriers to further integrating demand response into the CAISO market. The CAISO emphasizes the term "further" because significant amounts of demand response are already integrated and functioning in the CAISO market as the result of Southern California Edison Company's (SCE) integration efforts, and the Commission's clear policy to integrate supply demand response into the CAISO market. The CAISO is committed to collaborating with the Commission to reduce barriers to demand response participation in the market, and, importantly, work with the Commission to determine the demand response development and delivery model that simultaneously, and most cost-effectively, serves the needs of customers and the needs of the transforming grid.

***Q2: Among the integration barriers (either listed in Section 2 above or added per your comments), which ones are the most important to resolve in light of the 2018 bifurcation deadline?***

In response to Question 2, the CAISO outlines below its list of integration barriers in order of priority. The CAISO provides comments on each of the identified barriers.

**A. CAISO Settlements**

At the Commission's February 22, 2017 demand response year-end workshop, the CAISO indicated it was undertaking a comprehensive review of 2015-2016 market activities and settlements for Proxy Demand Resources (PDR) and Reliability Demand Response Resources (RDRR). The CAISO initiated this review in response to notifications from market participants regarding missing events in the CAISO Demand Response System (DRS) and valid disputes regarding PDR/RDRR settlement inaccuracies. The review involved identifying all PDR/RDRR settlement disputes, re-validating corrected dispute settlements, and prospective settlement corrections.

The CAISO completed the review in May 2017 and identified three main categories of issues:

1. The CAISO's legacy DRS<sup>1</sup> was not receiving the appropriate payload from the market to identify that a demand response event occurred; therefore, the DRS was unaware of an event and no performance measurement was performed;
2. The DRS failed to calculate a performance measurement in certain cases, even when meter data (both event day and historic data) was available;
3. The DRS calculated the performance measurement but in some cases did not send the values to the settlement system, and therefore no settlement occurred.

The CAISO fixed all of the issues identified in the comprehensive review and has reprocessed the 2016 DRS data. The CAISO provided accurate performance information to the Commission in response to the Commission's annual subpoena.<sup>2</sup>

Corrected settlements will occur at the next available settlement recalculation, which will occur on the nine month (T+9M) or eighteen month (T+18M). The CAISO expects to resettle all corrected trade dates by October 2017.

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<sup>1</sup> The CAISO's legacy Demand Response System and its functions have largely been replaced by the CAISO's updated Demand Response Registration System (DRRS).

<sup>2</sup> [http://www.aiso.com/Documents/January20\\_2017-CPUC\\_RA\\_Subpoena.pdf](http://www.aiso.com/Documents/January20_2017-CPUC_RA_Subpoena.pdf).

As a result of the comprehensive review and corrective actions taken, the CAISO implemented additional monitoring controls to identify and expedite resolution of any new PDR/RDRR settlement issues. Additionally, the CAISO is working closely with demand response providers (DRPs) to alert affected entities regarding any identified missing performance measurements. This will allow these entities to take corrective actions and minimize inaccuracies in the PDR/RDRR settlements.

The CAISO received general stakeholder support for the Energy Storage and Distributed Energy Resource Phase 2 initiative proposal (ESDER 2 Proposal) to have all baseline calculations, including the current 10-in-10 load baseline calculation, performed by DRPs (or their respective scheduling coordinators) and submitted to the CAISO as Settlement Quality Meter Data (SQMD). Shifting this responsibility to the scheduling coordinator accelerates the timeline for retirement of the CAISO's legacy DRS. The CAISO believes this change will provide a more consistent and flexible approach to performance calculation management and SQMD processing for all PDR/RDRR participants. The CAISO Board of Governors will consider whether to adopt the ESDER 2 Proposal at its July 26, 2017 meeting.

#### **B. Changes to Commission and CAISO Baselines**

As indicated in Section A, above, CAISO staff will seek approval from its Board of Governors on July 26, 2017 to file new demand response settlement baselines with the Federal Energy Regulatory Commission (FERC). The CAISO relied on a stakeholder led working group to vet and propose alternative baselines that provide new and more accurate options for different customer types and demand response applications. The CAISO encourages the Commission to have interested parties vet whether and how utility supply demand response program baselines should align with the expanded CAISO baseline options that will be available if approved by FERC.

One particular issue the Commission should consider is how baselines applied at the individual customer level (which is the investor-owned utilities' current approach) align with the baseline options the CAISO offers that are applied at the aggregate resource level, *i.e.*, the collection of customers that make up a PDR or RDRR. The CAISO would be concerned if applying different baselines at different aggregation levels leads to divergent performance results between the retail versus wholesale applications of a utility's demand response program.

Aligning wholesale and retail baselines, and performance evaluation methods generally, should be a Commission priority to ensure consistency.

### **C. Resource Adequacy Issues**

There are three key resource adequacy-related issues that affect demand response: (1) the ability for slow response, energy limited resources to address contingencies that require prompt response to maintain grid reliability, (2) the late peak shift due to significant and growing additions of solar photovoltaic (PV) resources, and (3) the shift from capacity to capabilities as traditional resources are displaced with variable and decentralized energy resources.

1. *The CAISO and the Commission continue to study how to incorporate slow response, energy limited resources to maintain local reliability.*

On April 3, 2017 the Commission and the CAISO hosted a second joint workshop on Slow Response Local Capacity Resources that focused on demand response resources in the CAISO's market and their current capabilities, with emphasis on serving needs in local capacity constrained areas. The CAISO presented a detailed overview of supply demand response resources' characteristics and how the CAISO's market optimization software uses information about these resources to make resource commitment and dispatch decisions.

The CAISO and the Commission also held a workshop on October 3, 2016 that explored availability requirements for slow response resources that are energy limited and cannot be dispatched within 20 minutes post-contingency. The CAISO and Commission expect to hold a third joint workshop outlining the reliability needs of the system and how demand response programs should be structured to meet those needs. The joint agency workshops fulfill a requirement of the CAISO's May 13, 2016 Executive Appeals Committee decision on a proposed change in the Reliability Requirements Business Practice Manual which directed the CAISO to "seek to conduct a joint workshop with the [Commission] to address how demand response resources can help the [CA]ISO effectively address NERC, WECC and [CA]ISO reliability standards applicable to local areas." The CAISO expects that results and recommendations from these joint workshops will be incorporated in the Commission's next resource adequacy proceeding to develop the minimum availability requirements from slow response demand response resources seeking to qualify as local capacity resources.

2. *Shifting peak load hours are changing when demand response is most needed.*

Demand response has been used and valued as a tool to reduce peak demand during stressed system conditions, *i.e.*, conditions when capacity is scarce. Traditionally, capacity

scarcity was correlated with gross peak load conditions. However, over the past decade, significant renewable resource capacity additions, especially in the form of solar PV resources, have reduced the incremental value of capacity additions at the peak load hour due to the abundance of solar generation available during those peak hours. Like peak generation capacity, the value of peak load shedding has been largely undercut by the increased solar productivity during the traditional gross peak, resulting in shifting net peak hours to later in the day, *i.e.*, when load consumption remains high but solar energy production is declining and unable to offset the same level of demand.

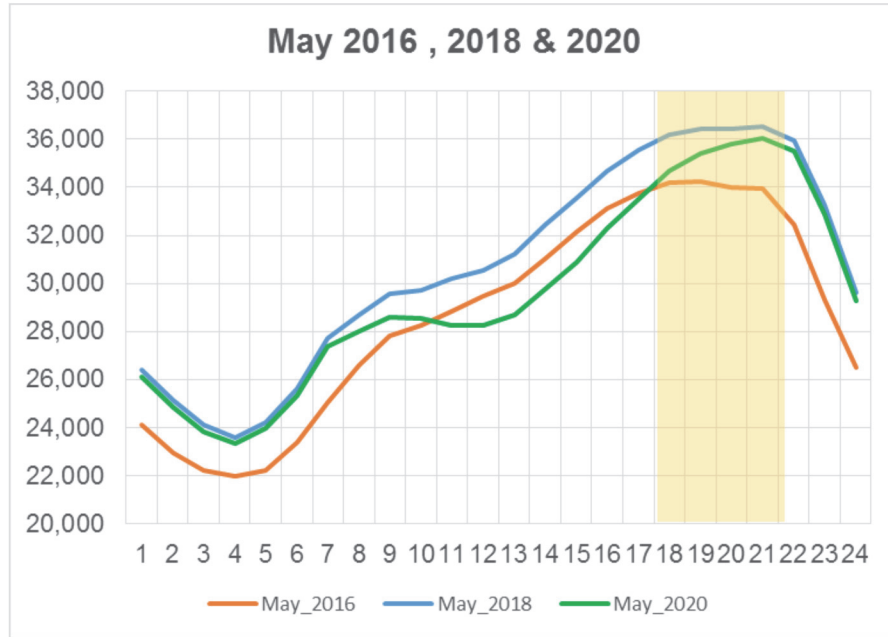
Today's grid requires resources that can respond quickly, have low minimum output levels, and can deliver energy during the evening hours, when solar output is naturally declining. Demand response can help meet these needs, but with the transforming grid, demand response must be available much later in the day (*i.e.*, between 4:00 p.m. and 9:00 p.m.) rather than mid-afternoon. If a resource cannot deliver grid benefits during the hours of greatest need, this must be taken into account when setting resource adequacy values. For example, the effective load carrying capacity (ELCC) methodology recently adopted by the Commission takes into account the unique availability of wind and solar resources in setting their resource adequacy values. A similar approach should be applied to demand response resources to ensure they qualify for the amount of capacity they can deliver during the highest need hours.

In contrast, evaluating the value of demand response resources during hours when there is excess capacity and when low or negative energy prices occur will likely reduce the effective load carrying capacity (and value) of traditional peak-shaving demand response. To remain a viable and beneficial resource, demand response must transform as the grid transforms. As part of its tariff requirement to establish Availability Assessment Hours, the CAISO recently performed an analysis to review the hours of greatest system need, *i.e.*, when system gross peak loads are highest.<sup>3</sup> Figure 1 shows the evolving load shape for the month of May in the years 2016, 2018 and 2020. This figure clearly demonstrates how the peak hours shift later in the day, to between 4:00 p.m. and 9:00 p.m. These hours are not aligned with traditional peak-shaving demand response, which is typically only available until 6:00 p.m. or 7:00 p.m.

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<sup>3</sup> See 2018 Annual Review of Availability Assessment Hours, [http://www.caiso.com/Documents/AgendaandPresentation\\_2018AnnualReviewofAvailabilityAssessmentHoursJun6-2017.pdf](http://www.caiso.com/Documents/AgendaandPresentation_2018AnnualReviewofAvailabilityAssessmentHoursJun6-2017.pdf).

**Figure 1: Expected Load Shape Evolution: May**



The CAISO’s analysis clearly shows that the coincident gross peak load hour has shifted later in the day. Below are the hours the CAISO has identified as the hours of greatest system need in the summer and winter:

- Summer (April 1 to October 31): 4:00 p.m. – 9:00 p.m. (HE17–HE21);
- Winter (November 1 to March 31): 4:00 p.m. – 9:00 p.m. (HE17–HE21).

Due to concerns about potential misalignment between the CAISO’s Availability Assessment Hours and the Commission’s Qualifying Capacity hours for demand response resources for the upcoming resource adequacy year, the CAISO will request a waiver from FERC to maintain its currently effective Availability Assessment Hours (1:00 p.m. to 6:00 p.m. in the summer) for the 2018 resource adequacy year. The CAISO intends to present this information regarding the clear shift in gross load peak hours in the Commission’s next resource adequacy proceeding to allow the Commission to align its Qualifying Capacity hours with the CAISO-identified Availability Assessment Hours for the 2019 resource adequacy compliance year.

3. *The transforming grid is changing the type of demand response needed.*

Former Commissioner Florio captured the challenges facing demand response in his cover letter introducing LBNL’s 2025 Demand Response Potential Study by stating:

The most prominent conclusion of the [DR Potential] study is that traditional demand response – that which reduces hot summer peak demand – may be of limited value in the future, a conclusion, which is equally true for generators of a similar operating profile. In its place, the study finds a need to shift customer usage patterns to complement abundant day-time solar generation. Similarly, the study finds that demand response is not of equal value in all places, but rather of greater value in targeted locations. These conclusions deserve careful consideration and, where reasonable, action.<sup>4</sup>

Demand response must transform from being primarily a peak shedding resource to load shaping and shifting resource. This can be achieved primarily through time-variant retail pricing that reflects grid conditions. Additionally, the grid will need dispatchable demand response supply resources that are capable of responding quickly, more frequently, and based on location specific needs, to help balance a much more dynamic supply and demand profile. The Commission’s resource adequacy program already incorporates a flexible capacity requirement based on a three-hour ramp requirement, but the addition of significant quantities of behind the meter solar resources and the build out of renewable resources to the meet the state’s renewable portfolio standard are creating greater short-term forecasting challenges and uncertainty from market interval to market interval. This increased uncertainty means the system requires a certain amount of flexible supply and demand resources to balance the system and maintain grid reliability.

Given the transforming grid, the Commission’s highest priority should be to emphasize the need for flexible demand response resources. Specifically, the Commission should consider what new demand response models are needed to develop and deliver the next generation of cost-effective demand response to help transform the grid and help California achieve its environmental policy goals. The Commission should consider independently studying how the existing demand response “program” model is working, and if a “program” development and delivery model is the proper path forward for demand response to meet the needs of the transforming grid. The program model should be contrasted with a competitive solicitation model, in which specific grid needs are procured from the most effective and lowest cost preferred resource solutions through competitive solicitation. Existing and future development and delivery models should be evaluated to contrast how effectively each model serves the needs of the transforming grid, meets the diverse needs of customers, and provides ratepayer value by

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<sup>4</sup> Commissioner Florio’s cover letter introducing LBNL’s 2025 Demand Response Potential Study can be found by opening the “Final Report” link at: <http://www.cpuc.ca.gov/General.aspx?id=10622>.

avoiding new generation, transmission and distribution assets while delivering system, local, and flexible resource adequacy capacity value.

## II. Questions Regarding the Pathway to Implementing New Models of Demand Response

The Ruling seeks input regarding the activities listed in Section 3. Table 1, below, provides the CAISO’s prioritization and comments on each activity.

**Table 1**

| CAISO Priority | Section 3 Item # | Activity   | CAISO Comment   |
|----------------|------------------|--|---|
| 1              | #6 & #8          | <p>Create and implement more accurate dynamic prices signals tied to wholesale pricing.</p> <p>Consider and adopt consistent time-of-use periods with demand response and rate design (through workshops in the time of use proceeding and demand response applications).</p>  | <p>These activities potentially can provide the most value. They will help shape load favorably to align with grid conditions. The Commission’s goal should be to minimize supply and demand volatility that must be managed in real-time.</p>  |
| 2              | #5 and #11       | <p>Coordinate the efforts of CAISO and the Commission to integrate demand response into the CAISO market, including new models of demand response (through a working group driven by the demand response rulemaking with a report also submitted to the resource adequacy proceeding).</p> <p>Develop and define data access rules to enable new demand response models (Proposed to be done in IDER proceeding but currently in the scope of DRP and not IDER).</p> | <p>The Commission needs to consider how to develop demand response to serve specific needs on the grid and create more tailored, competitively procured, and aggregated demand response/distributed energy resource (DR/DER) solutions to serve those needs.</p> <p>Data access rules are essential and a high priority, assuming a competitive demand response market emerges. Robust data access will inform DR/DER solutions, reduce costs, enable risk management assessments, customer screening, decision making, and importantly, investment in customers and development of preferred resource solutions.</p> |



| CAISO Priority | Section 3 Item # | Activity   | CAISO Comment  |
|----------------|------------------|--|--|
| 3              | #1               | Resolution of local resource adequacy requirements for demand response; and,<br><br>Review of qualifying capacity requirement for weather-sensitive demand response. | Variability of temperature sensitive demand response is problematic for operations if a resource's resource adequacy Qualifying Capacity is not accurate and a variable resource is treated as a fixed resource for resource adequacy purposes.  |
| 4              | #4               | Align retail and wholesale baselines and diversify the baselines by customer and load.   | CAISO is proposing new and more robust baselines to more accurately reflect demand response performance for different demand response types. CAISO would be concerned if misalignment between retail and wholesale baselines produce significantly different performance results, resulting in incentives for retail customer to not perform when needed by the CAISO. |
| 5              | #2               | Define and develop new products including both load consumption and bi-directional products.   | CAISO supports such development with the caveat that the Commission should identify and resolve retail and retail rate interactions first before CAISO invests in developing a wholesale bi-directional product.   |
| 6              | #10              | Develop characteristics and values of demand response for distribution system.   | The CAISO fully supports this essential activity. The Commission must resolve multi-use policy issues as a priority.   |

***Q3: Parties at the workshop recommended that defining and developing new products, including both load consumption and bi-directional products, should be performed through the use of a working group. Do you agree? If so, should the working group be facilitated by the Commission's Energy Division, the Utilities or another entity or organization? Would the working group need additional expertise to assist them? What kind of additional expertise, e.g. academic, consultant, would the working group require?***

***Q10: Activity 2 proposes defining new products including load consuming and bi-directional products.***

*a. Workshop participants proposed using a working group to conduct this activity. Explain why you agree or disagree. If you disagree, what other approach should the Commission use?*

*b. Is it possible to address retail rate and pricing policies that determine the load shape and availability of demand response at the same time as working to design a wholesale load consuming product based on the Potential Study Shift service, but dispatched only occasionally? If yes, please explain a process and whether any specific issues need to be resolved on one front (retail or wholesale) before they can be decided on the other.*

*c. Should the Commission use the approaches in 10.a to address any policy, cost or technical barriers to the New Models being developed? For instance, parties have raised the issue of demand charges, which are handled currently in general rate cases, as well as costs for automated controls and telemetry. If so, what coordination efforts are needed?*

The CAISO addresses Questions and 3 and 10 together as they are related. The CAISO continues to believe that retail rate impacts and demand charges are fundamental barriers that should be addressed and resolved before the CAISO can consider creating a wholesale bi-directional PDR product. The CAISO views these barriers as impediments to customer interest and robust customer participation in a bi-directional PDR product. The CAISO remains concerned that without resolution of retail issues, the CAISO will expend significant staff time, information technology resources, and money developing a product that will not be utilized until retail rules and or rate reforms are resolved. Like all demand response products, a bi-directional PDR product has retail impacts and interactions that must be clearly understood and resolved as a first priority.

Moving forward, the existing Load Consumption Working Group (LCWG), a stakeholder led working group created as part of the CAISO's ESDER Phase 2 initiative, should consider if and how it interacts with any future Commission load consumption-working group, which the CAISO supports, and if consolidation into a single working group is the most prudent path forward. The CAISO looks forward to collaborating with the Commission and the LCWG to help vet and resolve the issues around load consumption and the possibility of developing a bi-directional PDR product.

***Q4: For Activity 9 listed above, what are the remaining CAISO integration issues related to load shedding demand response that need to be resolved? Do any of the issues require a Commission decision in this proceeding? Which issues require resolution through other venues, e.g., changes with the CAISO tariffs? Please explain.***

The CAISO is not aware of any remaining issues that must be resolved relating to load shedding demand response.

***Q11: Clarify the following activity items listed in Section Three:***

***c. Activity 1b refers to capacity value for ramping. Explain whether you agree that demand response should be compensated with capacity payments for providing ramping? Should payments be considered for a load taking New Models products during morning ramp or a load-shedding product during the evening ramp, or both?***

Demand response is currently capable of receiving flexible resource adequacy credit and value for ramping during CAISO-identified periods of need; therefore, there is no need to create an additional revenue stream to provide ramping.

Respectfully submitted,

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July 6, 2017