Stakeholder Comments Template

Energy Storage and Distributed Energy Resources (ESDER) Phase 4
March 18, 2019 meeting

Submitted by	Organization	Date Submitted
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1. **Non-Generator Resource (NGR) model**
    a. SOC management
    b. Multi-interval optimization

The CAISO should manage commitment and dispatch of NGRs in a technology agnostic manner. Consequently, the CAISO should manage SOC of the NGR rather than have SCs do so. Managing the SOC allows the CAISO to economically commit and dispatch NGRs to meet system needs, as with other resources. The CAISO's SOC management is also consistent with the CAISO's stated needs of having flexible economic resources rather than the alternative.

The CAISO should also consider allowing an option for SCs to be able to provide a desired end-of-day SOC. For those SCs wishing to set their resources up for the next day, this will be a useful tool. This will still have the CAISO manage the SOC but within the constraint of an end-of-day target for those SCs that wish to make use of such an option.

A prerequisite for the CAISO's better management of resources in RT is for the CAISO to have better information of RT conditions. The current limited 4.5 hour STUC horizon does not help toward meeting this goal. One approach toward better RT information was the CAISO's Extended STUC initiative. However, this was cancelled and, to SCE's knowledge, not continued in DAME or any other initiative.

The examples provided to date exemplify operations for hourly storage resources for which spread bidding is unlikely to pose a significant challenge. Resources with longer operation duration are unlikely to be easy candidates for spread bidding particularly when the scheduling horizon between the day-ahead and real-time markets is not aligned. The current scheduling horizon forecloses strategic decisions such as charge the resource overnight to facilitate a few hours of discharge early in the morning of the following day yet preserve the capability for a full charge followed by a full or partial discharge later in the day when prices are attractive to support those decisions.

It remains unclear what spread bidding concept is being referenced within the recent presentation[1] since the graphic presented represents the inter-hour spreads only. In contrast, within an optimization environment, the spread modeled reflects the intra-hour difference between the shadow prices of the power balance constraint and the charge/discharge constraint.[2] Does the CAISO's presentation mean that the calculation of inter-hour spreads is an exogenous activity within the spread bidding optimization paradigm?

Even if the ISO wishes to use spread bidding as the basis for its optimization model, further clarity is needed on how such modeling will treat price curves with no discernible peaks and troughs. That is, when the duck really flies.

2. **Bidding requirements for energy storage resources**

   Given the increasing growth of storage in the CAISO fleet, SCE supports bid mitigation and bid insertion for NGR. SCE also understands that to be able to effectively mitigate, the determination of accurate Default Energy Bids (DEB) for storage, is a precursor.

3. **Demand Response resources**

   a. DR operational characteristics – Please provide comments on the ISO's proposal for DR resources to reflect a non-zero Pmin.

   b. Weather sensitive – Seeking feedback on potential forecasting methodologies and approaches for validating SC-submitted forecasts.

a. DR operational Characteristics:

While the CAISO's March 18, 2019 proposal to leverage a non-zero Pmin resource registration may be appropriate for some resources; and can help address some of the challenges with addressing the operational characteristics of Demand Response (DR) resources, SCE asks the CAISO to consider implementing a maximum run time parameter. SCE proposes using maximum run time as an additional constraint. The already existing constraint, Maximum Daily Energy Limit (MDEL) can help some of the event (dispatch) time/duration limitations of Demand Response resources, but it is not effective for DR resources whose output varies throughout the day and have daily run time limitations that must be managed. For these types of resources, a maximum run time parameter is a better determinant of the binding condition of operation rather than daily energy limit and as such allows for more accurate representation of the characteristics of the DR resource.

[1] http://www.caiso.com/Documents/Presentation-Energy-Storage-DistributedEnergyResourcesPhase4-Mar18-2019.pdf

[2] Brijs, Tom, Geth, Frederic, Siddiqui, Saleh, Hobbs, Benjamin F., Belmans, Ronnie. (2016) Price Based Unit Commitment Electricity Storage Arbitrage with Piecewise Linear Effects, Journal of Energy Storage, Vol.7, p.52-62.

This issue has been discussed during 2018 and 2019 at the CPUC's Demand Response Supply Side Working Group (SSWG) with Demand Response stakeholders, including the CAISO.

Attachment A to these comments includes illustrations that help clarify the challenges with using the MDEL and demonstrates the benefits to enabling a maximum daily run time parameter.

b. The core issue is that Weather Sensitive DR's (WSDR's) contribution is not scaled with a change in load. Any method determining the QC for WSDR should take into account the variation of WSDR output with change in load, rather than a fixed value. ELCC is not appropriate since it provides a fixed QC with respect to load. The CAISO should also recognize that while WSDR may have reduced availability on certain days, those days are typically not the highest load days when reliability events are typically called and when the WSDR resources have larger capacities.

In ISO-NE, demand response resources with weather-sensitive characteristics are awarded capacity supply obligations in the capacity auction consistent with their seasonal demand reduction value. If the resource is an on-peak demand type there are different considerations in relation to its performance.[3] The must-offer obligation for such resources in the day-ahead and real-time markets is consistent with their capacity supply obligations and allows the resources to re-declare their minimum and/or maximum reduction value, the minimum reduction time, and minimum time between reductions after publication of the day-ahead market results but prior to the real-time market, also known as the re-offer period. Any changes made to the offered reduction require approval from the ISO.[4] The minimum time between reductions is an indirect time limiter for the resource when combined with the maximum reduction value and the ramp rate of the resource. If similar characteristics can be reflected within the CAISO's markets for these resources, their resource adequacy obligations can become flexible with their weather sensitivity.

4. **Discussion on BTM Resources**

a. Potentially removing 24x7 settlement requirement for non-resource adequacy resources utilizing the DERA/NGR participation model.

b. Providing a forum for industry stakeholders to discuss potential QC methodologies for multi-tech type DERs for LRA consideration.

5. Additional comments

[3] ISO New England Manual for Market Operations, Manual M-11, effective October 4, 2018. P. 2-7 and Market Rule 1, Section III.1.9 - Section III.1.10.

[4] ISO New England Market Rule 1 Section III.1.9.

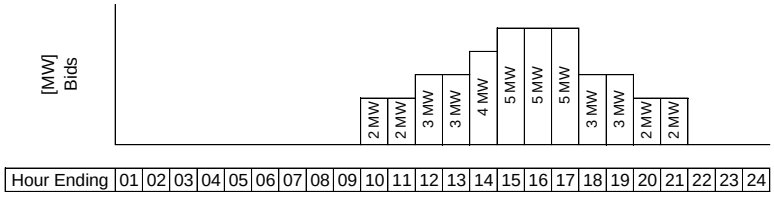
SCE supports the 2019 implementation of the removal of the single LSE requirement for PDR/RDRR registrations and the removal of the DLA and appreciates the CAISO committing to address this issue in Phase 3A Implementation.

Attachment A

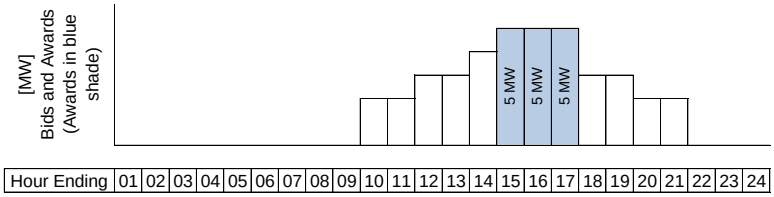
Illustrative Example

- Resource with available load drop that varies by hour: DR program rules limit: max three hour event time per DR program rules. Offered to CAISO with MDEL = 15 MWh

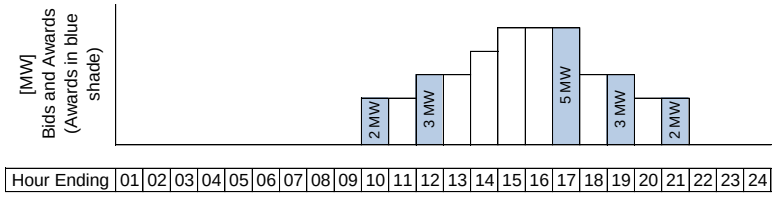
- Resource offered(bid) into CAISO for all available hours:



- CAISO awards three adjacent hours in compliance with MDEL and DR program rules:



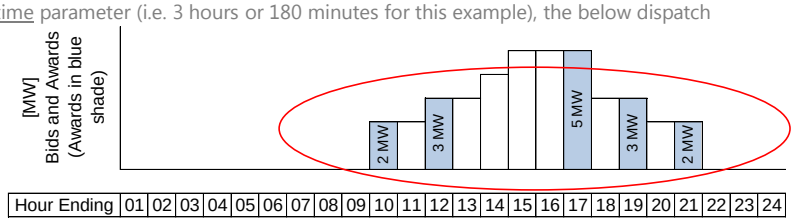
- CAISO award multiple hours in compliance with MDEL, but not in compliance with DR program rules:



Illustrative Example, continued

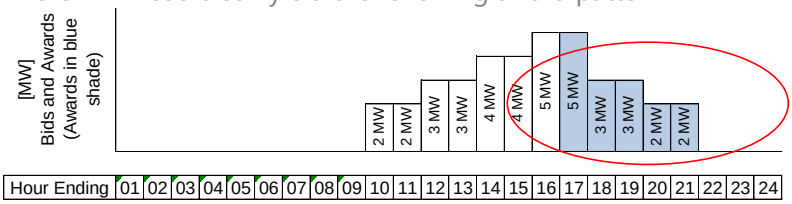
- Resource with available load drop that varies by hour: DR program rules limit: max three hour event time per DR program rules. Offered to CAISO with MDEL = 15 MWh
- CAISO sees the below sequence of awards as one long dispatch (resource is on for 12 hours), and CAISO sees this as only 1 start for the resource
  - Per typical DR program rules, this would be seen as 4 DR events, each one hour long
- Defining a max daily run time parameter can help in managing DR resource program constraints, providing flexibility in bidding, while facilitating awards that are in line with DR program limitations
  - If CAISO observed a daily max run time parameter (i.e. 3 hours or 180 minutes for this example), the below dispatch sequence would not be awarded

- CAISO award multiple hours in compliance with MDEL, but not in compliance with DR program rules:



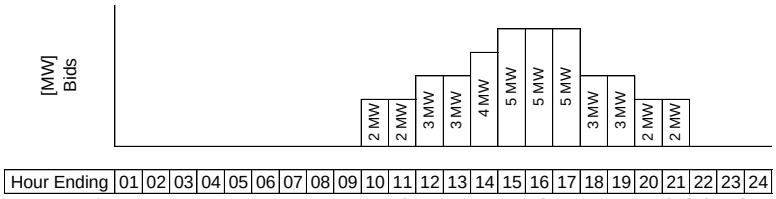
- Could CAISO's proposal from the ESDER4 March 18, 2019 to use non-zero Pmin address this? SCE thinks it cannot. Applying a non-zero Pmin could still yield the following award pattern

- CAISO award multiple hours in compliance with MDEL, but not in compliance with DR program rules (5 hours of awards exceeds DR program 3 hour limit):

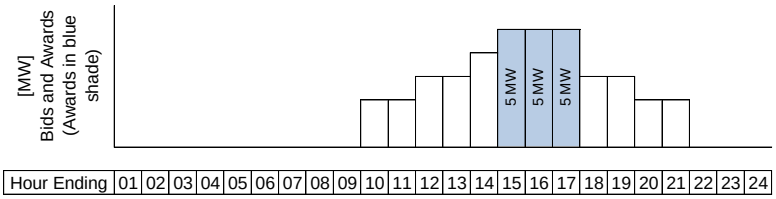


Illustrative Example, continued

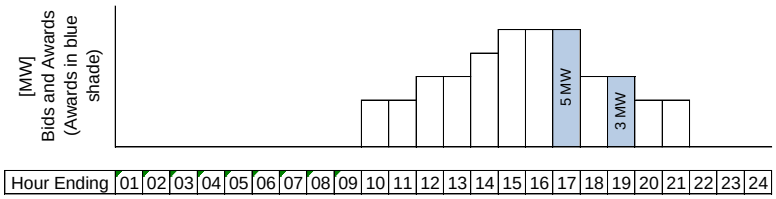
- Resource with available load drop that varies by hour: DR program rules limit: max three hour event time per DR program rules. Offered to CAISO with MDEL = 15 MWh, and max daily run time of 180 minutes (3 hours)
- Resource offered into CAISO for all available hours:



- A max daily run time parameter in CAISO's resource data template would help ensure CAISO awards that accurately reflect DR resource limitations:
  - CAISO awards three adjacent hours in compliance with MDEL, max daily run time, and DR program rules:



  - CAISO award multiple hours in compliance with MDEL, max daily run time, and DR program rules:



End Attachment A