California ISO

Stakeholder Comments Template

Energy Storage and Distributed Energy Resources (ESDER) Phase 4

This template has been created for submission of stakeholder comments on the Straw Proposal for ESDER Phase 4. The paper, stakeholder meeting presentation, and all information related to this initiative is located on the initiative webpage.

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business **May 17, 2019.**

Submitted by	Organization	Date Submitted
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Please provide your organization's general comments on the following issues and answers to specific requests.

1. **Non-Generator Resource (NGR) model SOC parameter**

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

3. **DR operational characteristics**

Olivine offers the following comments regarding DR operational characteristics:

Startup costs and Minimum load costs are both now fixed MasterFile parameters (fixed hourly costs for Minimum Load Costs). Given delays in implementing CCE DEBE, this will not be changed now until Fall 2020, when Min Load will be a biddable, hourly parameter and can be used with 0 PMin. With existing options and there are still functionalities that are important to DR that will not be allowed:

1. Ability to modify the minimum curtailment level in daily bids. This is especially with block dispatchable resources where minimum curtailment level could equal maximum curtailment level. Currently, Minimum Curtailment is equivalent to PMin, which is a Masterfile parameter that takes a week to change. Other markets allow a biddable minimum curtailment level. This would also allow

variable capacity but relatively inflexible resources to properly reflect their operating characteristics in the day-ahead and real-time markets.
2. Maximum Curtailment Time. If #1 is fixed, then this may not be as big of an issue for block dispatchable resources, but could still be an issue for resources with more flexible curtailment ranges but limited operating times (eg, a 4 hour resource with 0.5 MW PMin and 1 MW PMax could be kept online for 8 hours at 0.5 MW without violating a 4 MWh daily energy limit)

Another issue with commitment costs is that commitment costs can be useful in preventing non-contiguous dispatches, but a DR participant may want to lower bid prices in order to actually receive a market dispatch. The NBT, however, would only apply to energy bids, so unless a resource allowed to bid energy below the NBT, it may be difficult to get significantly increase the chance of dispatch with a startup cost included or with a 0 PMin but nonzero Minimum Load Bid.

We present several examples of how it is possible, if difficult to model DR costs today and/or in the future with commitment costs:

Normal bid price is $300/MWh with maximum of 4 hour, minimum 1 hour commitment, but typical dispatch of only 1 hour.
Resource is typically 1 MW curtailment (so 1 MW PMax). Actual cost is at least $100 per event regardless of any curtailment, minimum hourly cost of being available when online is $100, and there is additional $100/MWh cost of curtailment. Consider the following 5 scenarios:

1. Resource is flexible between 0 and 1 MW
2. Resource is flexible between 0.5 and 1 MW
3. Resource is not flexible in dispatch.
4. NO cost per event or minimum hourly costs, only $300/MWh of curtailment, resource is not flexible in dispatch
5. No cost per event or minimum hourly costs, only $300/MWh of curtailment, resource *is* flexible in dispatch

Our understanding is that it is common for resources today to be operated in a manner that would make Scenario 3 or Scenario 4 the most plausible options. Neither is fully supported by market mechanisms today, nor is there a plan to fully honor these in the future.

Scenario 1:

- Set Minimum Curtailment to 0
- Set Startup Costs to $100
- Set Minimum Load Bid to $100/hour (to account for hourly availability costs)
- Energy bid curve from 0 to 1 MW of $100/MW
- Set Daily Energy Limit of 4 MWh.

In this case, a resource *could* be at 0 MW for an extended period, BUT only if it is worth $100 to keep online doing nothing. The 0 MW time period should count towards the maximum run time because resource has been committed and compensated for availability.

Scenario 2:

- Set Minimum Curtailment to 0.5 MW
- Set Startup Costs to $100
- Set Minimum Load Bid to $150/MWh (to account for both the hourly cost and the cost of the first 0.5 MWh of curtailment)
- Energy bid of $100/MWh for the 0.5 to 1 MW segment.
- Set Daily Energy Limit of 4 MWh

Time at Minimum Curtailment *should* count for program daily, monthly, annual run limits. It is possible that the "partial" curtailment could mean just curtailing half of customers, but CAISO would not be able to distinguish this from curtailment of half of available load.

Scenario 3:

- Set Daily Energy Limit of 4 MWh
- Set Minimum Curtailment to 0.99 MW
- Set Startup Costs to $100
- Set Minimum Load Bid to $200/hour (to account for hourly availability costs plus curtailment cost)
- Energy bid curve from 0.99 to 1 MW of $0/MWh (*not currently supported*)

OR

- Set Daily Energy Limit of 4 MWh
- Set Minimum Curtailment to 0.99
- Set Startup Costs to $100
- Set Minimum Load Bid to $200/hour
- Energy bid curve from 0.99 to 1 MW at NBT. (This leads to some chance of dispatch at 0.99 MW instead of 1 MW)

OR

- Set Daily Energy Limit of MWh
- Set Minimum Curtailment to 0
- Set Startup Costs to $100
- Set Minimum Load Bid to $200/hour
- Energy bid at $0 from 0 MW to 1 MW (not currently supported)

OR

- Set Daily Energy Limit of 4 MWh
- Set Minimum Curtailment to 0
- Set Startup Costs to $100
- Set Minimum Load Bid to $200/hour-NBT
- Energy bid at NBT from 0 MW to 1 MW (for total bid cost of $200 to reach 1 MW)

Dispatch at PMin *should* count towards maximum run hour limits. Even if resource is not dispatched above zero, it is paid for availability and must prepare for response.

There should *not* be an issue with CAISO failing to honor Daily Energy Limits if PMin=0.99 MW. However, if PMin=0, there are some edge scenarios where prices could be such that resources would be kept online for an extra hour. For example, LMP could be $1000, $300, $300, $300, $1000 for five consecutive hours, so it may be worthwhile for CAISO to keep resource online for that fourth hour at 0 MW for $100 in order to utilize the energy for the final high-priced hour. This kind of scenario is potentially realistic in the real-time market where there can be more price volatility.

Scenario 4:
Same as Scenario 3 except Startup Cost would be $0 and Minimum Load Cost would be $300 or $300-NBT

Scenario 5:

- Set Minimum Curtailment to 0
- Set Startup Costs to $0
- Set Energy Bid to $300/MWh from 0 MW to 1 MW

This is essentially how resources are typically bid today. Since resource is fully flexible, it would be able to transition between 0 MW, 1 MW, and back within short order. In this case, a maximum curtailment time should *not* consider time spent at PMin until the first curtailment interval. This is because the resource has indicated 0 startup costs, and thus commitment to 0 MW should not require any changes to regular operation. However, once the resource is actually started, the maximum curtailment time would be important and it may not be appropriate to assume the resource could simply operate between 0 and 1 MW for an extended period just because the total instructed energy for the day has not yet reached 4 MWh.

We look forward to discussing these issues in future meetings.