



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 Working Group Meeting for ESDER Phase 4 that was held on August 21, 2019. 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 **September 4, 2019**.

| Submitted by | Organization | Date Submitted |
|---------------------------|--------------|----------------|
| Cody Hill & Sandeep Arora | LS Power | Sep 4, 2019 |

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

1. Discussion on non-24x7 settlement of BTM Resources

Which areas will require the local regulatory authority to change its rules or provide clarification to load serving entities?

LS Power does not have any specific comments on this topic however is concerned that implementation of non-24x7 settlement of BTM resources without addressing the issues identified with its implementation may unintentionally negatively impact the NGR resources which participate 24x7 in CAISO markets. Several issues with respect to this implementation have been raised by stakeholders and these need to be carefully addressed before anything is implemented. These include jurisdictional issues, prevention of double counting and/or preventing unintended wholesale charging and retail discharging, interconnection issues, requirement for operational infrastructure upgrades for better communication etc.

2. Market Power Mitigation for energy storage resources

LS Power continues to believe that the Opportunity Cost for Storage projects needs to be carefully accounted for in CAISO's DEB calculations. It is overly simplistic to assume that the only opportunity storage projects have is to charge middle of the day when solar output is close to its max and discharge later in the

day when solar ramps offline. While this use case makes intuitive sense from bulk energy shifting perspective but there are several additional opportunities that a Flexible product such as Storage has within an hour where it could respond to prices and dispatch counterintuitively, such as discharging for a few 5-min intervals during one of the “solar close to max output” hours (which could be due to a market event or local congestion leading to price spikes at the project’s LMP node) and then back to charging for the remaining 5-min intervals for this hour. If DEB doesn’t capture these Real Time 5-min dispatch opportunity costs, then this will be a disincentive for Storage in providing the flexibility that CAISO needs in Real Time.

With respect to the two options proposed in the calculation of cycling costs, LS Power believes the second proposal is preferable. We submit that the analysis presented leaves out one important variable that drives degradation rates for lithium ion batteries, which is the Resting SOC. Basically, keeping a battery full all the time means keeping it at a higher voltage, which is analogous to a mechanical system being kept in a state of constant high pressure. Logically, higher SOC on average means higher voltage on average which means more rapid degradation and loss of capacity, all else (i.e. throughput, depth of discharge of cycles) being equal. We are not saying that CAISO needs to model this parameter explicitly, but given the overwhelming popularity of lithium ion batteries among proposed projects it does steer the choice between CAISO’s two proposed options more toward the second option based on delta SOC from one interval to the next.

Ultimately, we reiterate that DEB’s used for mitigating the market power of specific storage resources should be designed with a few things in mind. First, the DEB should consider both variable operating costs, which was explored in this working group and we see progress in that direction, and opportunity costs, which we have heard less about. We urge CAISO staff to ask themselves repeatedly as the DEB formulas come together, “will this potentially lead to the battery being discharged at lower prices and as a result is the battery more likely to be empty and unable to deliver energy during heat waves, congestion events, flex alerts, etc.?” Since these are mostly capacity resources with Resource Adequacy contracts, this is the critical question to ask.

3. Variable Output Demand Response resources

LS Power has no comments on this topic at this time.

4. Additional comments

Please offer any other feedback your organization would like to provide from the topics discussed during the working group meeting.