Stakeholder Comments Template

Submitted by	Company	Date Submitted
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Please use this template to provide your written comments on the ESDER Phase 2 stakeholder initiative Third Revised Straw Proposal posted on April 17, 2017.

Submit comments to InitiativeComments@CAISO.com

Comments are due May 18, 2017 by 5:00pm

The Third Revised Straw Proposal posted on April 17, 2017 and the presentation discussed during the May 4, 2017 stakeholder conference call can be found on the ESDER Phase 2 webpage.

Please use this template to provide your written comments on the Third Revised Straw Proposal topics listed below and any additional comments you wish to provide.

1. Alternative Baselines to Enhance Demand Response

Section 5.1.3 of the Third Revised Straw Proposal provides the alternative baselines proposal that was developed by the Baseline Analysis Working Group ("BAWG"). The CAISO requests that stakeholders provide comments on the proposal in the following areas:

a) Do stakeholders support the BAWG's recommended baselines for adoption by the CAISO?

b) Does the BAWGs proposal report, April 4, 2017 version, provide the necessary level of detail for demand response providers to implement the proposed baseline options?

Comments:

Tesla supports the CAISO's adoption of the baselines as developed by the BAWG and has no additional comments at this time.

2. Distinguishing between Charging Energy and Station Power

Section 5.2.3 of the Third Revised Straw Proposal provides the station power proposal developed by the CAISO. The CAISO requests that stakeholders provide comments on the proposal in the following areas:

a) Given that the California Public Utilities Commission ("CPUC") has issued a Decision on its Track 2 storage issues, it is prudent for the CAISO to seek feedback from stakeholders on what changes should be made to the CAISO tariff in light of potential changes to retail tariffs.
b) The CAISO believes that it also may be prudent to reduce the amount of verbiage in the CAISO's station power definition. A simpler approach for the CAISO's purposes could be to define station power simply as energy to serve load located on a generating unit site and jurisdictional to the local regulatory authority and settled pursuant to a retail tariff. The CAISO request stakeholder feedback on this subject.
c) Based on the current CPUC Decision on its Track 2 storage issues, the CAISO's principal concern is that there could be potential for storage resources to "commingle" their charging load and station power load. The CAISO requests stakeholder feedback on what CAISO tariff revisions will be necessary to ensure that this issue does not arise. One solution could be to require that all wholesale load and retail load be metered completely separately. The CAISO is interested in other potential solutions that would not require separate metering and clear electrical bifurcation of loads.

Comments:

Station power rules are quite nuanced, but extremely important to ensure that wholesale functions are appropriately treated as such. This, in turn has significant implications for whether storage systems can economically participate in wholesale energy markets. As stated in Tesla's comments on the CPUC's Proposed Decision on Track 2 storage issues in R.15-03-011, we fully support designating energy uses essential to battery operation, such as battery management system and thermal regulation system energy use, as wholesale loads, thus ensuring that they are charged wholesale rates for energy used to support these fundamental functions of a battery system.

Additionally, Tesla would like to further understand instances where CAISO believes that separate metering would be inadequate to prevent the commingling of charging and station power loads. Under our current understanding, and given the CPUC's recent determinations regarding what constitutes station power versus wholesale loads, Tesla believes such instances would be rare. If CAISO does find this as a significant area for concern, Tesla suggests convening a stakeholder group to discuss the specific scenarios and identify potential solution pathways including estimation methodologies as an alternate potential solution to separate or additional metering.

3. Net Benefits Test

Section 5.3.1 of the Third Revised Straw Proposal provides the net benefits test proposal developed by the CAISO. The CAISO requests that stakeholders provide comments on the proposal.

Comments:

Tesla has no comment at this time.

4. Increase Load Consumption as Demand Response Enhancement

Section 6.1.4 of the Third Revised Straw Proposal provides an update on the status of work on this topic. The CAISO believes that there are several first priority policy issues that must be addressed before a wholesale load consumption product can be developed. The CAISO looks forward to collaborating with the CPUC and Load Consumption Working Group to help resolve these fundamental issues and develop a path forward for designing and implementing a bi-directional Proxy Demand Response product. The CAISO requests that stakeholders provide comments on the discussion in Section 6.1.4.

Comments:

Tesla strongly supports that enhancements to the PDR product include increasing load. Recognizing that oversupply of generation has already resulted in periods of low or negative pricing in the middle of the day, there is a clear and urgent need to develop this enhancement to PDR to improve market efficiency. Implementation of bi-directional PDR could be done with minimal market developments.

Increasing consumption on a retail meter due to wholesale market dispatch results in retail and wholesale settlements. The end-use customer needs to pay retail rates for the load consumed and the CAISO would issue wholesale settlements at the market clearing price. The burden is on the customer to manage risk of double charges by controlling their economic bids. For example a customer may insert negative bids to declare a price at which it would be willing to consume energy in return for a payment, considering the fact that load increase results in additional

retail charges. This structure does not trigger any jurisdictional issues given that no changes to retail rate treatment are being proposed.

While we recognize CAISO's concerns around retail rate impacts and demand charges, we believe that the burden is on customers to ensure wholesale market activity does not create net charges for the customer when considering wholesale and retail settlements combined. We do not agree that CAISO must wait for retail rate design issues to be resolved in order to create a bi-directional PDR product.

5. Non-Generating Resource Enhancements

Section 6.2.4 of the Third Revised Straw Proposal provides an update on the status of work on enhancements to the non-generating resource model. The CAISO requests that stakeholders provide comments on the discussion in Section 6.2.4.

Comments:

Tesla maintains that evaluating and clarifying the framework for metering and settlement of resources that do not participate in the wholesale market 24/7, such as behind-the-meter storage, is critical in order for multi-use application (MUA) opportunities to provide benefits to multiple customers. We also continue to agree that NGR modeled storage resources should qualify as a use-limited resource (use-limited resources being defined as "resources that, due to design considerations, environmental restrictions on operations, cyclical requirements, such as the need to recharge or refill, or other non-economic reasons, is unable to operate continuously"). Further, it is important to fully understand, as the revised straw proposal notes, storage performance limitations and non-linear degradation based on state of charge and depth of cycling. Considering these outstanding opportunities for further refining NGR enhancements, Tesla supports the CAISO's continued inclusion of this topic area under ESDER Phase 3 (Apr. 17 revised straw proposal, p.32).

6. Multiple-Use Applications

Section 6.3.3 of the Third Revised Straw Proposal provides an update on the status of work on multiple-use applications. The CAISO requests that stakeholders provide comments on the discussion in Section 6.3.3.

Comments:

As noted in previous comments submitted by SolarCity[1], Tesla strongly supports the CAISO's collaboration with the CPUC on establishing pathways for MUA in the next phase of the storage proceeding, R.15-03-011. Stacking the values associated with multiple uses increases the resource value and economic viability of energy storage systems, while improving wholesale market efficiency and reducing costs to the electric grid. At the same time, we recommend that MUA for distributed energy resources (DERs) continues to be part of the scope of topics for ESDER Phase 3. It is simpler from a process standpoint and stakeholder engagement perspective to proactively include the complete range of outstanding topics that need to be addressed in Phase 3 in order to fully enable DERs to participate in wholesale markets at the CAISO, recognizing that there may be multiple venues to address certain issues such as MUA.

In the revised straw proposal, CAISO also references that it will release a joint report with the CPUC on MUA efforts to date and host a workshop to discuss findings of the report with stakeholders (Apr. 17 revised straw proposal, p.31). Tesla looks forward to reviewing this report and engaging in any stakeholder workshops.

7. ESDER Phase 3

Section 7 of the Third Revised Straw Proposal provides a discussion about the topics that the CAISO currently anticipates will be within the scope of a third phase of the ESDER initiative. The CAISO requests stakeholder input on additional topics that could be included in the scope for ESDER phase 3.

Comments:

In addition to the topics listed by CAISO, which Tesla strongly supports including in Phase 3, we propose to add two items that stakeholders previously identified in ESDER discussions: 1) frequency regulation and 2) net export constraint.

1. Frequency Regulation

Extending frequency regulation participation to PDR would allow a set of deployed DERs to participate in a regulation market. Currently, significant capacity to provide this service is effectively stranded due to the absence of rules that allows behind-the-meter systems to provide these services. Tesla strongly believes that regulation markets should be accessible to DERs, and it is crucial that DERs be capable of providing these services to help improve reliability of the grid and reduce costs by increasing the supply of regulation services available. We continue to support PDR resources having both options of PDR Regulation as developed by

[1] In several instances throughout Tesla's comments above, SolarCity's previous feedback is referenced. Tesla Inc. acquired SolarCity on November 21, 2016.

the LCWG, including PDR Regulation with No Energy Settlement & PDR Regulation with Energy Settlement.

1.1 PDR Regulation with No Energy Settlement

A "zero-net energy" structure similar to the Regulation Energy Management (REM) model is proposed by the LCWG to enable capacity payments for resources providing regulation. To eliminate energy settlements, the regulation resource must return to its original set point, which can be the baseline load level.

1.2 PDR Regulation with Energy Settlement

This product allows resources to compete to provide regulation up or down and receive compensation for capacity, mileage and energy with the risk of managing operational complexities. For instance, BTM storage aggregators need to estimate State of Charge (SOC) available for grid services and manage energy discharge by bidding in one direction of regulation or vice versa. Performance measurements for this type of regulation service are important. Tesla is looking forward to collaborating with the LCWG to establish performance measurements, Automatic Generation Control (AGC) responsiveness and settlement structures. An ideal starting point for this is extending the existing Metered Generation Output (MGO) method.

2. Net Export Constraint

The demand response (DR) credit that customers can realize is currently limited by their onsite load. Thus, if a battery has the capacity to reduce demand by 5 kW, and a customer only has 2 kW of load during an event, 3 kW of capability will be left unused, even if that incremental 3 kW is valuable to the grid. This problem is particularly acute for customers that also deploy rooftop solar, since a daytime DR event or availability requirement (i.e. must offer obligation) will conflict with periods when rooftop solar is producing power and partially or completely offsetting onsite loads. Tesla believes this is one of the most significant barriers limiting opportunities for customers deploying distributed resources to participate in DR programs. In contrast to typical load-drop only DR programs, DERs such as storage that can export offer the potential for much higher availability and reliability because their usable capacity is not restricted by host load. A fully charged battery can fully discharge during an event even if host load is at zero.

In May 2016, CAISO submitted a tariff change to FERC which included adding the ability to measure performance by directly metering the output of storage discharge utilizing the MGO methodology. By implementing this tariff change, CAISO moved one step closer to enabling BTM storage to fully participate in PDR and provide additional services. The tariff change also noted that while BTM generation can export, it will not be compensated for the exported energy (May 2016 tariff redline, PDF p. 32-33).

Therefore, Tesla recommends that Phase 3 continues to build on this previous step by fully recognizing and developing a mechanism for compensating the ability for BTM storage to export energy during DR events even when on-site load is at zero. Removing the net export constraint also further relates to enabling MUAs for DERs and bi-directional PDR capabilities and is relevant to discussions in collaboration with the CPUC.

8. Other comments

Please provide any additional comments not associated with the topics above.

Comments:

Tesla has no additional comments at this time.