

Stakeholder Comments Template

Submitted by	Company	Date Submitted
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Please use this template to provide your comments on the presentation and discussion from the stakeholder meeting held on August 13, 2014.

Submit comments to EnergyStorage@caiso.com

[Comments are due August 20, 2014 by 5:00pm](#)

The presentation discussed during the August 13, 2014 stakeholder meeting may be found at:

<http://www.caiso.com/Documents/AgendaPresentation-EnergyStorageInterconnection.pdf>

Please provide your comments in each of the topic areas listed below.

[Applying the GIDAP to Cluster 7 energy storage projects](#)

The ISO invites stakeholders to comment on the framework developed under existing GIDAP rules for accommodating Queue Cluster 7 energy storage interconnection requests (see slide 7 and slides 11-18) and its future application to subsequent queue clusters.

The framework proposed by the CAISO for accommodating Queue Cluster 7 energy storage interconnection requests appears to provide a workable starting point. This includes the proposal to treat both discharging and charging functions as “generators” subject to communication and instruction requirements applicable to transmission-connected generators, as well as the proposal to provide information (several powerflow scenarios) helping to illuminate charging (“negative generation”)

deliverability issues but without explicitly studying or ensuring charging deliverability at this time.

However, it is essential to use this initial large experience with storage interconnection to learn more about issues and potential limitations for applying the interconnection procedures to diverse storage projects and their needs. As issues and limitations arise, they should be identified and addressed within the current interconnection cycle where feasible, or else via process modifications for future cycles. Besides including the CAISO, PTOs and interconnection customers, this process assessment should engage the broader range of stakeholders as much as possible.

Are changes to the GIDAP needed?

Given the framework developed under existing GIDAP rules for accommodating energy storage interconnection requests (i.e., without requiring modification to the GIDAP tariff), the ISO invites stakeholders to comment on whether changes to the GIDAP tariff are still needed. Stakeholders are asked to be specific and describe any changes they believe are needed despite this framework and explain why they are needed. (see slide 9)

It appears that for storage interconnection purposes going forward, changes to the GIDAP will be desirable. For storage viability from a business perspective and for providing (and being certified for) system RA and flexible capacity, there will need to be some method for determining the “deliverability” (timeliness and dependability) of charging, not only to support the discharging function, but also to support the charging function itself such as for providing downward flexible capacity. While the CAISO’s initially proposed *reliability* studies for charging (negative generation) will provide some insight into these deliverability issues, there will ultimately need to be a fuller and more formal assessment of “charging deliverability”, and such an assessment should occur in a coordinated and comprehensive manner within a unified (charging and discharging) storage interconnection process at the CAISO. Some information needs and assurances regarding dependability of charging might still occur via PTOs analyzing storage as firm load, but this remains to be clarified.

Ongoing consideration and clarification of the issues discussed above regarding “deliverability” of storage charging will also need to inform consideration of how *distribution connected* and *customer* storage should be studied. For example, improved understanding of the “deliverability” of charging for transmission-connected storage should inform processes for studying distribution connected and customer storage, and may help clarify circumstances (e.g., time windows, MW magnitudes, grid locations) under which charging deliverability is not constrained and does not need to be analyzed in depth.

Resource Adequacy

The ISO invites stakeholders to comment on whether they favor “unbundling” flexible capacity from system/local capacity as a means of facilitating energy storage in California and explain why or why not. (see slides 22-30)

CPUC Staff believes that it may ultimately be possible to unbundle flexible capacity from system/local capacity. However, at the present state of storage interconnection, charging/discharging deliverability issues, and definition of flexibility products for procurement and operational purposes - - it appears that unbundling is premature. The CPUC may consider unbundling issues in its upcoming RA proceeding. When the RA construct moves to a more probabilistic approach, analysis of specific peak stress conditions to analyze capacity and its deliverability would be replaced by analysis of a broader range of system conditions having significant potential to produce capacity stress. This could alter the distinction between studying traditional peak RA stress conditions versus the broader range of conditions for which flexibility may be needed.

Is a “charging deliverability assessment” needed?

The ISO invites stakeholders to comment on whether a test is needed to ensure that a storage resource is able to fully charge during each 24-hour day in order to be able to discharge to

provide its full RA value. If you believe such a test is needed, how would you propose such a test be performed? Please be specific. (see slide 31)

For commercial viability and to justify the substantial per-MW investment, storage projects should not be substantially transmission-restricted in their ability to provide (1) energy market arbitrage by charging when prices are low and discharging when prices are high and (2) dependable capacity at times when such capacity is needed, which may or may not correspond to the most desirable charging and discharging windows for energy market arbitrage purposes.

This requires sufficiently accurate assessment of deliverability not only for discharging but also for charging. Depending on the operating characteristics (e.g., charging and discharging durations) and location of a storage project, conditions needing to be assessed to test charging deliverability may be straightforward and limited, and it may even be readily apparent that there are no significant network limitations for charging. A first level of charging deliverability analysis should thus be designed to screen out situations where charging is not network-limited. System scenarios studied for this purpose should be appropriately conservative but not more conservative than warranted by storage projects' operating characteristics and intended operations. For example, if a storage project requires X hours to charge and is desired to be available to discharge during times of daily peak net loads and/or highest up-ramp of net loads, then this might leave Y hours per day available to charge, where Y is considerably greater than X. In this case, the charging deliverability analysis and any screening to determine that deeper charging analysis is unnecessary should be designed to consider conditions most likely to restrict charging *among the X daily hours most favorable to charging, among the Y hours available.*¹ The analysis should not be more conservative than this. Of course, if the storage project is intended to charge during a particular window, such as to provide downward flexibility during times of maximum PV production, then a charging deliverability study should examine such conditions.

¹ If charging would not need to occur daily, this should also be taken into account.

How charging deliverability (“ability to charge”) analyses are developed will clearly depend on (1) lessons learned from the present interconnection cycle, with such lessons needing to be maximized and openly discussed, (2) the characteristics of particular storage projects and what it takes to develop a manageable and not overwhelming set of protocols to address this variety, and (3) how need for and definitions of RA and flexibility products evolve. What does appear to be certain now is that there will be a need to assess deliverability (dependability) of charging and that such assessment should be part of an integrated storage interconnection process that accounts for both charging and discharging and is able to reasonably accommodate the diversity of storage projects.

Other issues

The ISO invites stakeholders to comment on any other issues within the scope of this energy storage interconnection initiative.

Comments: