

## Stakeholder Comments Template

Submitted by	Company	Date Submitted
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Please use this template to provide your comments on the Issue Paper & Straw Proposal posted on June 24, 2014 in the Energy Storage Interconnection initiative and as supplemented by the presentation and discussion during the stakeholder web conference held on July 1, 2014.

Submit comments to [EnergyStorage@caiso.com](mailto:EnergyStorage@caiso.com)

[Comments are due July 15, 2014 by 5:00pm](#)

The Issue Paper & Straw Proposal posted on June 24, 2014 may be found at:

[http://www.caiso.com/Documents/IssuePaper\\_StrawProposal-EnergyStorageInterconnection.pdf](http://www.caiso.com/Documents/IssuePaper_StrawProposal-EnergyStorageInterconnection.pdf)

The presentation discussed during the July 1, 2014 stakeholder web conference may be found at:

[http://www.caiso.com/Documents/Agenda\\_Presentation-EnergyStorageInterconnectionJul1\\_2014.pdf](http://www.caiso.com/Documents/Agenda_Presentation-EnergyStorageInterconnectionJul1_2014.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 its proposed approach for the application of existing GIDAP rules to energy storage projects in Cluster 7 (e.g., that existing GIDAP rules can accommodate Cluster 7 storage projects that want to be treated as generators for both aspects of their operation; how reliability and deliverability studies will be performed; that GIDAP will

not be utilized to assess requests to obtain a higher level of service for charging mode; and, the process for interconnection customers to seek such firm load service from the PTO through means other than the GIDAP). Stakeholders are asked to identify any issues with this approach for Cluster 7 and to suggest potential alternatives.

Comments:

Generation or Load?

With respect to the charging function of an energy storage device, the CAISO's paper indicates that there needs to be a "regulatory determination as to whether such load is retail or wholesale in nature." SDG&E believes, however, that a different threshold determination needs to be made; whether the charging function is "negative generation" or "load." SDG&E understands why a storage device would "want to be treated as generators for both aspects of their operation." If the charging function of an energy storage device is determined to be "negative generation" and not "load," then—based on current tariff provisions relating to generation—the range of costs applicable to the charging function is considerably limited.

All purchases of electricity through the CAISO's markets are regulated by the FERC and, in that sense, are "wholesale loads." For nearly all of these purchases, the CAISO assesses fixed transmission costs. In addition, for metered consumption within the CAISO Balancing Authority, the CAISO assesses Grid Management Charges (GMC) and other uplift costs associated with operating its markets. The CPUC has the authority to assess other retail costs on the basis of metered consumption. These include the costs of distribution wires, Public Purpose Programs, nuclear decommissioning costs, Competition Transition Charges, DWR bond charges, unaccounted for energy, franchise fees, etc. Loads, therefore, can be both wholesale and retail, and a wide range of costs can be applied to metered consumption. None of these costs are applied to metered generation.

Whether or not the charging function associated with a storage device is a "negative generator" or a "load" is a matter for regulators, and ultimately perhaps, the courts to decide. If it is decided that a storage device's charging function is a "load," then it will be necessary to determine exactly which of the above listed costs can be assessed against the metered consumption. This determination may turn on whether the load is characterized as "retail," in which case the full range of costs can be assessed.

The CAISO's paper states that "the ISO believes that the procurement of electric energy to charge an energy storage facility participating in ISO markets is a sale for resale and therefore a wholesale rather than retail transaction." If the CAISO's belief is upheld, the CPUC would have no jurisdiction to authorize the Investor Owned Utilities to recover distribution wires costs, Public Purpose Program (PPP) costs, nuclear decommissioning costs, Competition Transition Charges (CTC), DWR bond charges, Unaccounted for Energy (UFE), franchise fees, etc.

The CAISO's statement is based on the premise that the conversion of electric energy into some form of stored energy, does not constitute an end-use in and of itself. The storage medium is not relevant; be it the electro-chemical potential in a battery, the spinning inertia in a flywheel, the pressurized gases in a Compressed Air Energy Storage (CAES) facility, or the gravitational potential inherent in water stored in the upper reservoir of a pumped storage hydro facility. If, however, the process of creating the electro-chemical potential, spinning inertia, pressurized gases, or gravitational potential is determined to be an end-use, then the purchases of electricity that charge the storage devices would be a retail load subject to CPUC jurisdiction.

SDG&E is inclined to start from the premise that use of electricity to charge a storage device is an end-use. All wholesale costs assessable by the FERC (transmission wires costs, GMC, other CAISO uplift costs), and all retail costs assessable by the CPUC (distribution wires costs, PPP costs, nuclear decommissioning costs, CTC, DWR bond charges, Unaccounted for Energy (UFE), franchise fees, etc.) would apply. However, recognizing the potential value of storage technologies in supporting a range of public policy objectives, SDG&E also believes it may be entirely appropriate to credit-back as line items, some or all of these costs. For example, a credit could be applied based on the quantity of energy reinjected into the grid. The net result would be that the storage device owner pays for the above-listed costs only to the extent of the difference between what it withdraws from the grid and what it reinjects into the grid. Other credit-back mechanisms are possible. What is important is that there is complete transparency as to (i) the costs that the storage owner is responsible for, and (ii) the extent to which public policy preferences warrant relief from these costs.

The CAISO's paper notes that "the load forecast used in the ISO's annual transmission planning process is that approved by the California Energy Commission through its Integrated Energy Policy Report process and reflects only retail load growth;" the implication being that the CEC's load forecasts do not account for energy used to charge storage devices. This implication is not entirely accurate. For example, an elevator consumes electrical energy to lift an elevator car to the top floor of a building where energy is stored in the form of gravitational potential. When the elevator car descends it produces electrical energy. The difference between the energy consumed in lifting the elevator car and the energy produced when the elevator car descends, is reflected in the CEC's load forecasts.<sup>1</sup>

The CAISO's paper asserts that "to include such charging load in a retail load forecast would be inconsistent with the interconnection customer seeking access to wholesale rates to charge its facility." While SDG&E understands *why* a storage device would want to use wholesale rates to charge its facility, SDG&E does not understand how efforts by a storage device to obtain "access to wholesale rates to charge its facility" is determinative of whether the charging function is a retail or wholesale load. As indicated above, this determination depends on whether the charging of a storage device is found to be an end-use in-and-of itself.

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<sup>1</sup> Incidentally, from a cost recovery standpoint, this difference results in the same outcome as the credit-back example mentioned above.

### Reliability and Deliverability Studies

Between the CAISO's Generator Interconnection and Deliverability Allocation Procedures (GIDAP) (for discharging) and the CAISO's Transmission Planning Process (TPP) (for charging), a storage device's impacts on grid reliability are readily addressable. In the interest of developing a common study approach among the CAISO Participating Transmission Owners (PTOs) for the charging function, and to provide storage devices with non-binding information on possible grid conditions which could constrain the ability and timing of charging, the CAISO has requested that SDG&E use the GIDAP study process to evaluate the charging function. SDG&E has voluntarily agreed to do so with the understanding that the information that is produced and provided to the storage device with respect to its charging function will have no binding consequences for any party.

With respect to deliverability studies, SDG&E understands that Resource Adequacy rules may change (e.g., moving towards an Effective Load Carrying Capability (ELCC) methodology for defining system RA requirements, the addition of "flexibility" requirements) and that this has potential implications for the way the RA deliverability analysis is performed. However, until these changes are fully defined, it is hard to know how the deliverability analysis should be changed. Moreover, these changes would apply to all resources that offer dependable capacity, not just storage devices.

SDG&E notes that, to date, there are no studies demonstrating that "flexibility" needs to be provided on a locational basis. Generally speaking, it appears that resources providing flexibility services can be located anywhere within the CAISO Balancing Authority. Assuming that the ongoing renewable integration study work does not indicate otherwise, *local* RA requirements will continue to be driven by contingency conditions occurring during extreme weather conditions. The existing GIDAP can be used to identify the Delivery Network Upgrades (DNU) that would allow storage devices located within the Local Capacity Requirement (LCR) areas to obtain Full Capacity Deliverability Status (FCDS) while in a discharging mode. FCDS provides some assurance that the storage device's four-hour discharging capability can be counted towards a CAISO Load Serving Entity's (LSE's) local RA requirement.

### Firm versus Non-Firm Charging

The CAISO's paper asserts a distinction between "firm" and "non-firm" charging and postulates that a storage device that wants to charge at any time under any system condition is "comparable" to "firm" load and should be accommodated in the same manner as forecast load growth; i.e., through the PTO's standard process for identifying the distribution and transmission upgrades needed for new loads.

According to the CAISO, a storage device that is willing to curtail its charging under certain system conditions ("non-firm" charging) should be studied in the same manner as

“generators” using the GIDAP (although the CAISO believes the results of this study are informational only).

SDG&E is not convinced that there is clear distinction between “firm” and “non-firm” charging. Essentially all loads, including the charging function of storage devices, would curtail their consumption if the consequences of not doing so were to incur extremely high costs. Today, most loads are indifferent to the CAISO’s hourly/real-time prices because the CPUC-set rate structures in place settle the loads’ consumption on time-averaged prices. This will change as the CPUC-set commodity rate structures are revised to settle on time-intervals that more closely track the CAISO’s hourly/real-time settlement intervals.<sup>2</sup>

According to the CAISO’s paper “stakeholders support consolidating the interconnection process for grid-connected storage under the GIDAP in order to avoid inefficiencies of a bifurcated process that separates a storage facility into generation and load.” Notwithstanding SDG&E’s agreement to evaluate the charging function of storage devices as part of the Cluster 7, Phase 1 studies, SDG&E questions whether this approach will actually “avoid inefficiencies.”

From an economic efficiency standpoint, it makes sense that all distribution and transmission upgrades necessary to accommodate the charging function for storage devices be evaluated in the PTO’s distribution and transmission planning processes. This is where different alternatives for accommodating the charging function can be evaluated for cost-effectiveness. Additionally, for transmission upgrades that accommodate the charging function, CAISO-Board approval through the CAISO’s annual TPP is required in order to obtain cost recovery. The CAISO’s annual TPP provides another layer of assurance that only cost-effective transmission upgrades that accommodate storage projects that are likely to be built, will be pursued. The CAISO’s annual TPP is not constrained by the GIDAP rules that effectively require the CAISO to assume that every generator seeking to interconnect to the grid will actually be built.<sup>3</sup>

At this point in time SDG&E intends to examine the need for distribution and transmission upgrades to support the charging function of likely-to-be-built storage devices in SDG&E’s annual distribution and transmission planning processes. SDG&E believes this will actually reduce inefficiencies that would otherwise arise as competition among proposed storage devices for a place in the IOUs’ resource portfolios sorts out the winners and losers.

### Issues in scope for this initiative

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<sup>2</sup> Nearly all IOU customers now have metering that is capable of supporting commodity settlements at the hourly and sub-hourly level.

<sup>3</sup> Another benefit of using the PTOs’ annual distribution and transmission planning processes, and the CAISO’s annual TPP, to accommodate the charging function is that the costs of conducting the necessary studies and the costs of any distribution and transmission upgrades that are built, are shared broadly by all consumers. There are no direct cost assignments or advance funding obligations for the storage device.

Beyond Cluster 7, the ISO anticipates that it will receive further requests to interconnect energy storage projects in the Cluster 8 application window that will close April 30, 2015. Through this initiative, it may be possible to identify improvements that could be implemented prior to the Cluster 8 window so that those improvements can be applied to projects in that cluster.

Toward this goal, the ISO has identified the following three issue areas as in scope and invites stakeholders to comment on these.

- Interconnection request process. The objective is to ensure a one-stop, streamlined process for interconnecting energy storage to the ISO grid. Consolidation of all aspects (i.e., impacts of both discharging and charging) of energy storage interconnection under the GIDAP will be explored. Stakeholders are asked to explain where process improvements are most needed and could be most beneficial, and to suggest potential improvements.

Comments:

SDG&E is not convinced that “consolidation of all aspects (i.e., impacts of both discharging and charging) of energy storage interconnection under the GIDAP” is the best way of ensuring a “streamlined process” for interconnecting energy storage to the ISO grid. The GIDAP does not provide a mechanism for identifying cost-effective distribution and transmission upgrades to support the charging function of likely-to-be-built storage projects along with other forecast load growth on the PTO’s system. All of the PTOs have effective, time-tested, procedures in place for timely identifying, designing, securing regulatory approvals for, and building the distribution and transmission facilities necessary to serve the new customer loads that are added to the system each and every year. SDG&E fails to see how the use of GIDAP—with all of its administrative warts and wrinkles— will improve, or streamline, the process for accommodating a storage device’s charging needs.

- Interconnection study process. The objectives are to: (1) examine the alignment between the methodologies used in ISO interconnection studies (e.g., reliability, deliverability) and the energy storage configurations and use cases, and (2) determine whether any changes can or should be made to these methodologies. Although the ISO is not making any commitments as to the extent of any changes that may be made to these methodologies (again, both reliability and deliverability), the ISO is open to this examination and is inviting stakeholder input. Stakeholders are asked to explain how current interconnection study methodologies may not align with energy storage use cases and to suggest potential alternatives for how these studies could be performed. Given that the current deliverability study methodology is aligned with existing

resources adequacy rules, stakeholders are asked to suggest how these studies could be performed if those rules are assumed to change.

Comments:

See SDG&E's comments above.

- Project modification process. The objective is to examine whether any further changes (to the two existing project modification processes discussed in the paper: the modification request process and the independent study behind-the-meter expansion process) can or should be made given that developers may want to modify projects (e.g., to add energy storage to a renewable project) either still in queue or those is commercial operation. Although the ISO is not making any commitments as to the extent of any changes that may be made to these existing project modification processes, the ISO is open to this examination and is inviting stakeholder input. Stakeholders are asked to explain how these existing processes may not provide adequate means for requesting project modifications, and are asked to describe changes that could be made or suggest potential alternatives to these processes.

Comments:

At this time, SDG&E has no comments on this topic.

### [A framework for differentiating between energy storage configurations](#)

Although the ISO has identified the range of configurations that may be possible, due to time constraints the ISO is concerned that inclusion of all possible configurations in this initiative may jeopardize the goal of identifying GIDAP improvements that could be implemented prior to the Cluster 8 window. Thus, the ISO is recommending that this initiative focus solely on ISO grid connected storage configurations (and not distribution connected and customer sited). The ISO believes that solutions developed for ISO grid connected storage configurations will likely inform solutions for distribution connected and customer sited configurations (e.g., where appropriate, conforming changes could be made to distribution utility WDATs). Consistent with this approach, the ISO asks stakeholders to identify energy storage interconnection issues or challenges associated with ISO grid connected configurations (e.g., where the current interconnection rules may either fail to address or conflict with the needs of storage projects) and to make proposals for addressing these issues.

## Comments:

The CAISO may have this one backwards. It may be preferable to start with the “customer sited configurations” and let any GIDAP improvements resulting from that effort “inform” solutions for distribution-connected and transmission-connected storage devices. Customer-sited configurations may be the most challenging interconnection requests since they could involve both existing on-site load and existing on-site generation. Interactions among these loads, resources and the proposed storage devices, could result in widely-varying impacts on the PTO’s distribution and transmission facilities and implicate both the WDAT and the CAISO tariff.