

## Stakeholder Comments Template

Submitted by	Company	Date Submitted
Jan Strack Armando Infanzon Randy Nicholson	SDG&E	October 28, 2014

Please use this template to provide your comments on the presentation and discussion from the California Energy Storage Roadmap workshop held on October 13, 2014.

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

[Comments are due October 27, 2014 by 5:00pm](#)

Presentation materials and background information discussed during the October 13, 2014 workshop may be found at:

<http://www.caiso.com/informed/Pages/CleanGrid/EnergyStorageRoadmap.aspx>

**Please provide your comments regarding each of the actions listed below that were discussed during the workshop. In particular, please direct your comments towards refinements needed to each action and any additional actions that may not have been identified or discussed. Also, please provide feedback on the priority of the proposed actions.**

### Actions and venues to address barriers

#### *a. Actions to advance revenue opportunities*

- i. **Defining and communicating grid needs will clarify gaps in existing markets and help identify new products**

Action <sup>1</sup>	Venue(s)
Describe and clarify operational needs at the transmission level, and the operating characteristics required of storage and other resources, connected at either the distribution or transmission level, in order to meet these needs.	CAISO
Describe and clarify operational needs at the distribution level, and the operating characteristics required of storage and other resources connected at the distribution level in order to meet these needs.	CPUC
Facilitate clarification by IOUs of operational constraints that would limit the ability to accommodate storage on the distribution system and behind the customer meter.	CPUC

**Comments:**

To defer/avoid distribution infrastructure, distribution-level storage needs to provide performance guarantees. Utilities will be unwilling to forgo distribution infrastructure if they do not have certainty that the storage device can discharge (or charge) at the time, and for the duration, needed to ensure the distribution circuit is not overloaded.

The time and duration of need is circuit-specific. For lightly-loaded circuits, there may be no planned infrastructure upgrades that could be deferred/avoided. SDG&E anticipates that each utility’s annual Distributed Resources Plan (DRP) will identify (i) the circuits for which distribution infrastructure upgrades are planned within a reasonable planning horizon, e.g., five years, (ii) the planned upgrades, and (iii) the estimated cost of those upgrades. This information will provide a basis for estimating the value to consumers of deferring/avoiding the planned distribution infrastructure via the addition of distribution-level storage and other distribution-level generation.

From a reliability perspective, it is necessary for any customer with distribution-level storage, that the utility have a complete understanding of the maximum possible withdrawal from, and injection into, the distribution circuit. This could require, for example, a binding commitment that a storage device owner would not inject/withdraw more than a specified amount of power onto/from the grid during specified time periods. Presumably these commitments would be negotiated between the utility and the storage device owner at the time the customer seeks to add the storage device.<sup>2</sup> Alternatively, the utility would assume the storage device would be operated, in conjunction with on-site generation and load if any, at a level which maximizes stress on the distribution circuit and plan distribution infrastructure upgrades accordingly.

The CAISO has previously indicated that transmission-connected storage devices that defer/avoid distribution infrastructure could not also participate in wholesale markets; i.e., all energy withdrawals

<sup>1</sup> WDAT and Rule 21 are addressed under section 2.C.i

<sup>2</sup> CPUC rules require existing customers to notify the utility when the customer adds devices at its facility that have the capability to draw large amounts of power from the grid (e.g., behind-the-load-meter storage devices).

from the grid and injections onto the grid would be subject to retail ratemaking. SDG&E believes this rate treatment may be overly restrictive. SDG&E can envision, for example, storage devices added at the transmission level to defer/eliminate planned transmission upgrades designed to alleviate thermal overloads on transmission lines or transformers during contingency conditions on the hottest summer days. During other periods of time, the storage device owner should be able to participate in wholesale markets. Under existing FERC accounting rules, the “primary use” of the storage device would need to be determined in order to establish cost responsibility for the capital costs of the storage device. SDG&E believes these accounting rules may need to be changed in order to properly allocate these capital costs between consumers (to the extent the storage device defers/eliminates transmission infrastructure that would otherwise be built) and the storage device owner (to the extent the storage device participates in wholesale markets).

**ii. Clarify existing wholesale market product opportunities for storage**

Action	Venue(s)
Clarify existing energy and AS market products and requirements for energy storage to participate in the ISO market	CAISO
Clarify roles of storage in an evolving RA framework	CPUC

**Comments:**

SDG&E believes that the requirements for participation by storage devices in the CAISO’s wholesale energy and ancillary service capacity markets are already well documented in the CAISO tariff and associated Business Practices Manuals (BPM). Additionally, participation by storage devices in the CAISO’s wholesale markets is subject to the interconnection requirements set forth in (i) the utility’s Wholesale Distribution Access Tariff (WDAT) for distribution-connected storage devices, and (ii) the CAISO’s Generation Interconnection Procedures (GIP).

Regarding RA, SDG&E agrees that the existing RA framework will require some modification to more accurately reflect the contributions of emerging technologies like energy storage. However, SDG&E believes the starting point for any modification to the RA program must continue to focus on actual system needs: What are the forecasted RA requirements, and can this resource contribute to meeting those requirements? The answer to the last question must be yes. Any tendency to bend the system’s needs to fit the operating profile of a particular class of resources will both overvalue those resources, and lead to costly, duplicative RA procurement.

**iii. Refine existing and add new wholesale market products to meet grid needs**

Action	Venue(s)
Identify gaps and consider changes or additions to existing wholesale market products that would better meet grid needs and improve revenue opportunities for resources such as storage that can provide those needs.	CAISO
Further examine and clarify the role of storage in deferring or eliminating the need for transmission or distribution upgrades	CAISO, CPUC
Consider revising the ISO’s procedure for testing and certifying resources for ancillary services	CAISO
Streamline rules for aggregations of distributed storage units to participate in CAISO markets, including participation via use of the NGR model.	CAISO
Evaluate the need and potential for the development of distribution level grid services and products that provide new revenue opportunities for distribution connected storage resources.	CPUC

**Comments:**

SDG&E does not believe wholesale market product “gaps” exist. The CAISO’s existing wholesale markets provide a relatively effective way of ensuring reliable grid operation at low cost. Certainly refinements of the existing wholesale market mechanisms will occur over time (for example, to reduce the instances when the CAISO needs to take actions outside the market to ensure grid reliability and to reduce the amount of money that must be recovered through uplifts), but these refinements should not be driven by the commercial needs of any specific technology, including storage.

**iv. Identify gaps in rate treatment and identify existing rules that could address issues**

Action	Venue(s)
Clarify rate treatment for the charging mode of grid-connected or distribution-connected storage participating in the wholesale market under current ISO market settlement rules.	CAISO, CPUC
Clarify existing tariffs for Behind the Meter storage devices that are paired with NEM generators	CPUC
Consider new proceeding for stand-alone Behind the Meter storage devices to address rates for charging and exporting power	CPUC

**Comments:**

Storage devices that interconnect to the distribution system via a WDAT, or that interconnect to the transmission grid through the CAISO’s GIP, may seek to participate in the CAISO’s wholesale markets. Many stakeholders appear to support a rate mechanism that would treat all grid withdrawals by a storage device owner participating in wholesale markets as wholesale transactions subject only to CAISO hourly and intra-hours commodity charges (i.e., forward market and real-time Locational Market Prices (LMPs)).

FERC has ruled that “energy stored for later use” is wholesale and therefore no retail costs would apply to such energy. FERC has never specifically opined on whether conversion losses should also be treated as “energy stored for later use,” but in approving certain tariff provisions for east coast Independent System Operators, has implicitly accepted conversion losses as “energy stored for later use.”

SDG&E is concerned that as energy storage technologies advance and become easier and less costly to implement for a wide range of industrial, commercial and residential customers, customer participation in CAISO wholesale markets will increase and the ability to distinguish between “energy stored for later use” and retail end-use load, will become more difficult to discern and even harder to police. Accordingly, SDG&E believes any stakeholder consensus around the rates applicable to customers with energy storage devices that participate in CAISO wholesale markets must include agreement on (i) how the customers’ retail end-use will be identified and measured, and (ii) enforcement mechanisms that ensure a customers’ retail end-use consumption does not evade retail cost recovery.

Both FERC and the CPUC will need to be involved in, and approve, the rate mechanisms that will address SDG&E’s concerns regarding recovery of non-commodity retail costs from customers that use storage devices in wholesale markets and that have end-use loads.

**v. Define multiple-use applications of storage to facilitate development of models and rules**

Action	Venue(s)
Define and develop models and rules for multiple-use scenarios of storage where feasible.	CPUC, CAISO

**Comments:**

Beyond what is currently available under the Proxy Demand Resource framework, SDG&E believes work needs to begin now to define the appropriate rate treatment and metering requirements for existing customers with end-use load and on-site generation that wish to add storage devices behind their existing load meters and that intend to participate in wholesale markets. Ideally, these customers would be free to use their storage devices to achieve whatever commercial objectives the customer has. This could include, for example, selling ancillary services to the CAISO at the same time the customer is storing energy in certain time periods in order to minimize retail demand charges for its end-use load.

Ideally, only one meter would be needed to ensure the services provided to the CAISO were actually delivered, and to measure for settlement purposes all wholesale transactions and all end-use retail consumption.

**vi. Determine hybrid storage configurations to enable prioritization and development of requirements**

Action	Venue(s)
Identify and develop clear models of use cases for hybrid energy storage sites, and prioritize them for purposes of facilitating their participation	CAISO, CPUC, IOUs
For the use cases of greatest interest or greatest likelihood of near-term development, clarify the requirements and rules for participation.	CAISO, CPUC, IOUs

**Comments:**

SDG&E believes work needs to begin now to discuss specific set of use cases with hybrid storage configurations to study on a case by case basis.

**vii. Assess existing methodologies for evaluating storage and identify or develop a preferred common methodology**

Action	Venue(s)
Prepare report or summary of efforts underway to develop publicly available models for assessment of energy storage	CEC
Consider refinements to the evaluation methodologies used by IOUs for to support CPUC decisions on storage procurement	CPUC, CEC

**Comments:**

Stakeholders need to be clear about (i) what “refinements” to the evaluation methodologies used by the IOUs are needed, and (ii) the reasons that such refinements are needed.

**b. Actions targeted at cost reduction**

**i. Review metering requirements for opportunities to reduce costs**

Action	Venue(s)
Establish the value of and develop a regulatory and policy framework under which the ISO and UDC can share metering and/or meter data.	CPUC, CAISO
Establish rules for resource owners to submit settlement quality meter data	CAISO
Establish rules for UDC subtractive metering for BTM wholesale resources	CPUC
Establish rules for certifying sub-metering and third-party meter data collection and VEE	CPUC
Complete the Expanding Metering and Telemetry Options Phase I and II initiatives – “expand scenarios for SC metered entities”	CAISO

**Comments:**

A policy framework under which the CAISO and utilities share meter data already exists in the context of Direct Access and Community Choice Aggregation, and Proxy Demand Resources. The same principles could be applied for meter data applicable for storage devices.

**ii. Review telemetry requirements for opportunities to reduce costs**

Action	Venue(s)
Evaluate CAISO telemetry requirements for smaller resources	CAISO
Evaluate KYZ, increasing 1-minute requirement, 10 MW limit	CAISO
Evaluate value of common telemetry framework for California	CAISO
Complete the Expanding Metering and Telemetry Options Phase I and II initiatives – definition and support for “data concentrators”	CAISO

**Comments:**

SDG&E has no comments at this time.

**iii. Assess codes and standards to identify gaps and best practices**

Action	Venue(s)
Review existing fire protection codes for various energy storage technology and applications and identify best practices	CEC
Determine applicability and scope of UL and other certifications for stationary storage systems	CEC

**Comments:**

SDG&E has no comments at this time

**iv. Review interconnection process for small distribution-connected resources to reduce costs**

Action	Venue(s)
Address certification process for integrated device metering	CPUC
Address fees for interconnection of non-exporting resources	CPUC

**Comments:**

The term “non-exporting” needs to be clarified. A storage device can be added behind an existing utility meter and used in a manner that would result in injections to the grid (an “export”) during certain time intervals even though the storage device owner has not submitted an interconnection request to the CAISO that would allow the storage device owner to participate in wholesale markets. Is this storage device considered “non-exporting?” Any storage device that results in injection onto the grid will require study, and thus should have appropriate fees charged for this effort.

***c. Actions focused on process and timing improvement***

**i. Clarify interconnection processes to make it predictable and transparent**

Action	Venue(s)
Clarify existing interconnection processes, including developing process flow charts and check lists	CAISO, CPUC

Coordinate between Rule 21 and WDAT to streamline queue management processes	CPUC
Evaluate the potential for a streamlined or ‘faster track’ interconnection process for storage resources that meet certain use-case criteria	CAISO, CPUC, and IOUs

**Comments:**

Fast track interconnection processes already exist for storage devices that seek to participate in wholesale markets. Storage devices seeking to interconnect at the distribution level and participate in wholesale markets can pursue fast track interconnection through the utility’s Wholesale Distribution Access Tariff (WDAT). Storage devices seeking to interconnect at the transmission level and participate in wholesale markets can pursue fast track interconnection under section 5 of CAISO tariff Appendix DD. Via proposed changes to Rule 21, the IOUs are currently modifying their respective fast track screening processes to incorporate storage devices.

***d. Identify interdependencies and determine priorities to minimize delays***

During the workshop the Roadmap team highlighted the importance of identifying interdependencies among the actions. Correctly prioritizing actions and selecting the ones that currently either prevent other actions from being productive or directly prevent storage contracts from being signed will enable the CPUC, the CAISO and the Energy Commission to maximize progress in removing roadblocks to storage. Please provide comments on important interdependencies among actions that should be factored into the roadmap.

**Comments:**

SDG&E has no comments at this time

**Applicability to Storage Configuration and Use Cases**

The Roadmap team presented an early draft of a “matrix” that seeks to convey what actions will support each identified use case or storage configuration to come online and contribute to grid stability. Please provide comments and suggestions on how such a matrix can be made the most useful to stakeholders. If applicable, please provide examples.

**Comments:**

SDG&E recommends leveraging existing work conducted by CPUC, CEC, EPRI and other stakeholders related to use cases, and suggests convening a workshop to prepare a matrix of use cases.