

## 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 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:** It is clear that the Roadmap team recognizes there are multiple and valuable uses of storage that benefit a variety of entities throughout the electric grid. Solar Grid Storage supports the listed actions of clearly defining operational needs at both the transmission and distribution levels. Further, Solar Grid Storage firmly believes that the value for these needs must be as clear as possible in order for financing to be brought into storage projects. Solar Grid Storage expects that several revenue streams stemming from multiple services provided by the storage asset at both the transmission and distribution level will be required to make projects financially viable (i.e. the majority of storage assets will fall under the dual-use category). Clarity on what those needs are and how the service will be performed and compensated is essential to optimizing the value of storage to the California grid.

**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:** Please see our previous comment. We support these two actions and recognize their importance.

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

**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:** Given the unique attributes of storage assets as compared to generating resources, Solar Grid Storage supports the crafting and clarifying of the ISO's testing procedures for certification into ancillary services markets. Understanding timing and cost of testing and certification are critical in creating viable storage projects. Furthermore, clarity should be provided for stand-alone storage assets as well as storage assets connected with other generating resources (hybrid) in regards to the testing and certification procedures.

Solar Grid Storage strongly believes that the ability to aggregate distributed storage resources greatly increases the value of the assets to both the resource owner and to the California grid. The second to last bullet above on aggregation should be a high priority action item along with the third bullet on testing

**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:** Given that storage devices are not net generators of power and will always consume energy since no device is currently 100% round trip efficient, Solar Grid Storage believes that the charging and exporting from storage devices should be net-metered and fall under a wholesale tariff. Further, storage devices should not be punished with an unfavorable rate tariff as their exporting/charging will be done to support grid needs, which includes treatment of demand. Solar Grid Storage notes that storage systems interconnected at transmission level and providing ancillary services pursuant to FERC Order 755 or Order 784 will be required to have net-metering otherwise the economics of providing charge/discharge functions from a storage device are destroyed. Solar systems interconnected at retail in California are also net-metered. It is logical therefore storage systems co-located with a net metered solar systems that provide grid ancillary services should qualify for net metering.

**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:** Please see our comment for a(i). Solar Grid Storage believes many storage assets will fall under the dual-use category and therefore clear rules around these multiple-use scenarios will be essential for storage integration.

**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:** Solar Grid Storage believes that the combination of storage with generating assets such as solar PV creates a system that is greater than the sum of its parts. Therefore, Solar Grid Storage supports the prioritization of these hybrid models to provide optimal value to the grid. Solar Grid Storage believes the combination of solar PV with storage falls under the category of greatest likelihood of near-term development. However, rules for hybrid systems including other renewable and fossil based generators should be crafted given the variety of unique beneficial services each individual hybrid system can provide to the California grid.

**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	CPUC,

decisions on storage procurement	CEC
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**Comments:** No further comment.

***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:** Solar Grid Storage has found that storage resource owners require detailed and revenue grade metering data. Therefore, rules should be established for resource owners to provide this settlement quality data that will serve to streamline the process and reduce cost for both the storage project as well as CAISO and the respective IOUs in California. The first and second bullets above are the highest priority actions in this section.

Behind the meter storage systems should be allowed to provide grid ancillary services and a good model for the rules regarding size of storage system, aggregation opportunities and communications protocols and security is the PJM program for fast responding technologies providing frequency regulation. Not only would California benefit from the work already undertaken by PJM, similarities between the two markets would allow standardization of storage equipment allowing equipment providers to reduce costs.

**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:** Solar Grid Storage’s comment in b(i) applies here as well.

**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:** Solar Grid Storage supports providing clarity around safety codes and certification standards for the use cases in order to provide a level playing field for all storage assets to follow.

**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:** No further comment.

**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:** Solar Grid Storage supports these three action items and views the third bullet as the highest priority action item

***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:** Solar Grid Storage believes the most important interdependency is the creation of clear certification, metering, telemetry and interconnection rules in regards to multiple-use storage assets. Solar Grid Storage sees the most value arising from assets that can provide multiple services to the grid. Therefore clear rules for participation and the alignment of those rules to allow for multiple uses presents the most critical interdependence discussed amongst the identified actions.

**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:** No further comment.