

Stakeholder Comments Template

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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

[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 ¹	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:

What would the potential be for widely-distributed commercial 100-500kwh 'behind the meter' storage, islanded, without feeding power into the grid? Demand and supply can be managed through price signals. This would eliminate the operational issues of managing multiple supply inputs, by simply signaling when shifting to batteries to reduce demand is easier.

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:

¹ 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:

We have developed a DC Pico Grid system that combines PV, storage, LEDs and Automatic Demand Response; which only buys grid power and doesn't sell it back to the grid. It can serve as a grid resource as a demand reduction asset; while being less costly and much more efficient.

1. **DC PV arrays can be sized 25-35% smaller than AC PV systems**
2. **It eliminates the need/costs for converters, inverters and grid tie hardware**
3. **It eliminates the inherent multiple systemic DC-AC/ AC-DC conversion losses associated with grid tied PV and batteries, and for lighting the need for DC to drive LEDs**
4. **The system efficiency is higher**
5. **There is no need for grid tie permitting**
6. **It can also power a wide range of 100-277VAC equipment with no modifications and without the need for inverter**
7. **And, it operates during outages.**

- 8. Assuming a sufficient base of adoption, this system could collectively serve as a grid scale resource for everything from fast response to black start.

The benefits of our integrated system to society include:

- 1. Fewer natural and water resources needed
- 2. Lower costs that enable new business models that accelerate the adoption of the Top 4 elements of the Loading Order (Efficiency, Demand Response, Storage and Renewables)
- 3. General Business Continuity during outages
- 4. Business Continuity for Mission Critical and First Responder facilities during extended outages

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:

Our system contains an internal revenue grade meter with feedback sent over the ADR 2.0 B channel. Such a system could be used to verify performance of the collective asset. Rules need to be developed to assure veracity of vendor system data, and to address the deficiencies of today’s smart meters that only poll every 15 minutes and the fact that the net meter might not reflect the performance of a particular sub system.

The idea of an electric market where devices and systems can clear the market in real time, similar to how stocks and commodities trade, is how you need to envision and plan for the future. Anything else will be a band aid; and become the bottle neck to technological, market and society’s progress.

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:

Islanded DC Pico Grids that only buy from the grid.

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:

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:

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:

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:

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:

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:

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:

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:

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:

We will install a pilot of our system at NASA Ames in November, without PV. We’d like to be included in your matrix. We hope to work with NREL to finish our development of PV charged batteries for our system, and the dynamic blending of islanded intermittent PV DC and grid AC without batteries – both of which will help with the Duck Curve issue.