

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

[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:

SCE agrees that more clarity on how storage can assist with the operational needs of the system would be helpful. However, the second action on distribution system characteristics and operational needs can be guided and encouraged by the CPUC but is actually the responsibility of the distribution system owners. The distribution system owners identify system needs and request approval for funding those upgrades in the General Rate Case (GRC), which the CPUC approves. The CPUC, however, does not actually identify these needs. When the second action item is amended to reflect this difference, it appears quite similar to the third action item, so SCE recommends that these two action items be combined. Distribution system needs and constraints are already being addressed through Assembly Bill (AB) 327 efforts (e.g., Rulemaking 14-08-013), which is the appropriate forum because distribution system needs should be evaluated for all distributed energy resources comprehensively, not just for energy storage alone.

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.

SCE agrees that clarifying the Resource Adequacy (RA) criteria both from a system/local Net Qualifying Capacity (NQC) criteria as well as from a flexible Effective Flexible Capacity (EFC) criteria) is a critical action that should be a high priority. In addition, SCE agrees that the consideration of how such resources will be used to provide energy and Ancillary Services (including the flexible ramping product) are high priority items. SCE would also like the CPUC in coordination with the CAISO to delineate a specific timeline for the RA (both flexible and system/local) determinations and for the CAISO to delineate a specific timeline for the Flexible Ramping Product to guide solicitations.² SCE has active Requests for Offers (RFOs) and cannot accurately value RA and Flexi-ramp without knowing the requirements, so having a timeline would help SCE manage expectations and risk in ongoing and future RFOs.

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:

In regards to the first action item, it is important to note that the CAISO’s role is to assess market needs and ensure market efficiency rather than “improve revenue opportunities.” Such responsibilities are technology-neutral and focused on obtaining the required grid services, regardless of what type of

² SCE notes that the CPUC has recently issued an OIR that will discuss these topics and that the CAISO has an existing stakeholder process to discuss the flexible ramping product. SCE believes that concluding these processes is critical to developing a clear path forward for energy storage participation

resource provides them. As demonstrated through its Stakeholder Initiative Catalog Process,³ CAISO regularly assesses if new market products are required.

The fourth action item, regarding streamlining the rules for aggregation of distributed storage units under the NGR model, first needs to address the policy issues with behind-the-meter (BTM) resources that want to participate in the CAISO market. With the overturning of FERC Order 745, there are jurisdictional conflicts with retail customers (under the CPUC’s jurisdiction) participating in the CAISO market (under the FERC’s jurisdiction). These outstanding jurisdictional concerns should be addressed by the CPUC and the CAISO before stakeholders expend significant effort to define rules for the aggregation of BTM resources. Additionally, aggregation of BTM resources can be quite different from aggregation of distribution-connected resources; both types of aggregation must be subject to electrical geographic boundaries and may require different metering and telemetry schemes.

In regards to the final action item, the utilities are best equipped to value distribution-level grid services because they plan and operate the distribution system. Further, the responsibility of regulators and utilities should not be to “provide new revenue opportunities” for any particular technology, but to identify and properly compensate for the services they provide.

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:

Clarifying the rate treatment for storage is a high-priority action item. CAISO must clarify if the energy used to charge the device is considered Gross Load in order to determine appropriate infrastructure charges. The CAISO and CPUC must jointly agree on the rate treatment of auxiliary load, station power, and roundtrip efficiency losses as well as the definitions for each of these terms. SCE has a proposal for these rate treatment details and is eager to participate in the working group for determining rate

³ See CAISO’s Draft 2015 Stakeholder Initiative Catalog *available at* <http://www.caiso.com/informed/Pages/StakeholderProcesses/StakeholderInitiativesCatalogProcess.aspx>.

treatment. The full proposal is not included in these comments because the purpose of the roadmap is to identify the issues and venues for resolution, not to try to resolve the issues within the roadmap. The following is a brief summary of SCE’s proposal:

Energy storage represents a generation-function resource similar to other existing natural gas and renewable resources. In order to ensure equitable rate treatment for all customers, SCE believes that rate applicability requirements should be applied equally for all generation-function resources regardless of technology. Currently, all generation customers in SCE’s service territory who receive retail service are charged for the service at retail rate levels for the delivered end-use load. Parallel to standard generation sources, energy storage facilities also have station auxiliary load. These loads can include fans, pumps, computers, and lighting. SCE proposes these types of station loads be served from a separate retail meter. Energy storage facilities will be billed retail rates for load that is used to drive on-site auxiliary and station power.

In the case of the actual energy storage devices at the energy storage facilities, the charging and discharging load is treated as wholesale load where applicable wholesale charges are assessed. The discharging energy would be treated as generation, similar to any other generation resources. Therefore, retail rates would only apply to the end-use load typically comprised of inverter and transformer loads registered when the energy storage unit is in a steady state (neither charging nor discharging). SCE proposes that this specific type of end-use load be established in the testing and commissioning phase of the plant lifecycle. The established threshold amount would then be used to render monthly bills. In addition, customers will also be credited for the wholesale charges that are applied to any end-use load during the retail billing process.

In regards to the second action item on NEM-paired storage, the CPUC established the rules for NEM-paired energy storage in a May 2014 decision (D.14-05-033). In accordance with that decision, SCE will be updating its NEM tariffs to reflect the requirements adopted after a subsequent decision is adopted by the CPUC that addresses the estimation methodology for NEM-paired storage systems with storage devices sized at 10 kW (AC) and below. SCE is currently adhering to the interim provisions established in D.14-05-033 while the estimation methodology is determined.

In regards to the last action item on rates for BTM storage, the rates applied to a storage device that is located behind a customer retail meter are, by definition, retail rates. If BTM storage is seeking the ability to export energy to wholesale markets by responding to CAISO dispatch signals, then CAISO, FERC, and CPUC must first establish tariff changes to enable this configuration before deciding what rate such projects would be compensated at.

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

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Define and develop models and rules for multiple-use scenarios of storage where feasible.	CPUC, CAISO
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Comments:

The root of the multiple-use storage issue (storage that serves a customer need and also participates in the CAISO market as well as storage that serves a distribution system need and also participates in the CAISO market) is based on jurisdictional division between the CPUC and the FERC. Multiple-use storage must address questions about which “master” (the customer or the CAISO, or the distribution-operator or the CAISO) informs and controls the dispatch decisions, and how those dispatch decisions are communicated. SCE has been grappling with these challenges internally and plans to work externally with the other investor-owned utilities (IOUs) to develop a proposal for storage used as a distribution system asset that will also participate in the CAISO market. While the CPUC is eager to resolve these issues under its jurisdiction, there will likely need to be CAISO tariff changes and possibly FERC approval.

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:

SCE agrees that it is the responsibility of the utilities to incorporate hybrid energy storage projects into the valuation processes. Some projects cross over different procurements when a generation resource is part of the hybrid offer, essentially creating a combined offer. Hybrid offers may combine storage with a new generation resource or with existing generation, adding even greater contracting and valuation complexity. Each utility will develop its own method of evaluation for hybrid offers based on its procurement targets and needs.

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:

The CEC’s summary report will likely be helpful for developers seeking to expand or compare their modeling capabilities to assess the value of different storage projects. The CPUC may also refine the evaluation methodologies for the Consistent Evaluation Protocol if they see a need to do so.

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:

As long as the accuracy and integrity of metering and telemetry are maintained, SCE is open to reviewing the metering and telemetry requirements.

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:

As long as the accuracy and integrity of metering and telemetry are maintained, SCE is open to reviewing the metering and telemetry requirements.

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:

SCE recommends that any standards that are developed should not be “absolute” standards but rather a minimum standard that the energy storage device must meet *or exceed*.

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:

As long as the accuracy and integrity of metering and telemetry are maintained, SCE is open to reviewing the certification process for integrated device metering. In regards to the second action item, the roadmap should recognize that Rulemaking 11-09-011 is already addressing the fees for Rule 21 interconnection of non-exporting resources; therefore, this topic is already being addressed. There is a workshop scheduled for this Rulemaking in December 2014.

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:

SCE supports educating new stakeholders about the interconnection tariffs through process flow charts and checklists developed by the CAISO and CPUC. The current tariff language is quite explicit, however, so SCE does not see a need to “clarify existing interconnection processes” but rather explain existing interconnection processes to those who are unfamiliar with the processes.

In regards to the second action item, SCE is unsure what is meant by “coordinate between Rule 21 and WDAT”. If the “coordination” referenced is in the context of the interconnection studies, SCE already takes into consideration current Rule 21 interconnection requests when we perform WDAT interconnection studies. Similarly, SCE takes into account current WDAT interconnection requests when we perform Rule 21 interconnection studies.

Lastly, developing a “faster track” option specifically for storage is not aligned with the open access tariff goals, which aim to be technology neutral and avoid preferential treatment for interconnection customers. Storage developers that meet the current eligibility criteria, however, may seek to interconnect their storage projects through the existing Fast Track or Independent Study Processes.

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:

SCE continues to view the highest priority storage issue as determining the rates assessed for the energy used in charging a storage device. The lack of clarity around this issue delays and jeopardizes energy storage contracts and provides unnecessary risk to both parties entering the contract, as well as the ratepayers.

There are many interdependencies among the myriad energy storage issues, therefore creating a complete map or web to identify the interdependencies is difficult. One key issue that is interdependent with other action items listed in the roadmap is setting comprehensive requirements for Resource Adequacy. The utilities and the industry need certainty about the definitions of these products because they comprise a portion of some storage devices' value. The CPUC definition of RA will inform the products that the utilities buy but the CAISO definition of RA informs the products the utilities need. Coordination between the CPUC and the CAISO on the definition of RA and flexible RA is important for both developers and utilities to ensure the products being procured are sufficient to support the system.

Another key issue that may have a domino effect on other issues is how BTM storage that participates in the CAISO market will be compensated. The overturning of FERC Order 745 challenges the method by which demand response is settled with the CAISO. This overturning raises parallels concerns with BTM energy storage because BTM storage may also appear as demand response to the CAISO. The CPUC should clarify how BTM storage resources will be compensated for their participation in the CAISO market, before it goes into the details of rules for aggregation and compensation for storage paired behind a renewable generator's meter (e.g., storage paired with solar generation).

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:

The action items listed within this roadmap identify and explain the major issues around storage well. Creating the “matrix” of what actions support each use case and configuration seems to be a significant amount of extra work that may not be needed. There are similar issues across some use cases and configurations, and teasing them into separate processes may actually be less efficient and more cumbersome. The matrix is also quite difficult to interpret and does not provide clear insight into the connectivity of issues or interrelations. The action items listed in the draft roadmap appear to be a more effective means of delineating storage issues and necessary actions.